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执行蒙特利尔议定书
多边基金执行委员会
第八十三次会议
2019 年 5 月 27 日至 31 日，蒙特利尔

**增编**

# 关于附有具体报告要求的项目的报告

1. 印发本增编旨在列入与中国有关的、附有具体报告要求的项目的报告。

2. 本文件分为以下几个部分：

第一部分： 根据氟氯烃消费和生产淘汰管理计划相关协定对现行监测、报告、核查和执法制度进行审查（第 82/65 号决定和第 82/71 号决定(a)段）（开发计划署、环境规划署、工发组织和世界银行）

第二部分： 关于监测氟氯烃淘汰管理计划第一阶段受援企业泡沫塑料发泡剂消费情况及核查方法的现行制度的案头研究（第 82/67 号决定(c)段）（世界银行）

第三部分： 氟氯化碳生产、哈龙、聚氨脂泡沫塑料、二类加工剂、制冷维修和溶剂行业的财务审计报告（第 82/17 号决定）（开发计划署、环境规划署、工发组织和世界银行）

第四部分： 甲基溴消费行业淘汰计划（第 82/18 号决定(c)段）（工发组织）

第五部分： 甲基溴生产行业淘汰计划（第 82/19 号决定(c)和(d)段）（工发组织）

3. 每个部分都载有对项目报告或项目执行进度的简要说明以及秘书处的评论意见和建议。

## 增编背景

4. 本文件所载的各份报告系根据执行委员会第八十二次会议通过的具体决定提交。

一. 根据氟氯烃消费和生产淘汰管理计划相关协定对现行监测、报告、核查和执法制度进行审查（第 82/65 号决定和第 82/71 号决定(a)段）（开发计划署、环境规划署、工发组织和世界银行）

5. 执行委员会第八十二次会议审议了中国氟氯烃淘汰管理计划第一阶段的年度进度报告[1] 以及中国提交的氟氯烃淘汰管理计划第二阶段下四项[2] 行业计划的第三次付款申请。[3] 在联系小组讨论期间，若干成员对在该次会议上核准额外供资表示严重关切，因为东亚发生了原因不明的 CFC-11 排放。还有成员对报告中就可能存在的履约问题提供的信息虽然可靠但不够完整表示关切；有位成员回顾，中国政府已在缔约方第三十次会议上确认已查明 CFC-11 的非法生产问题。第 XXX/3 号决定要求提供更多信息说明 CFC-11 排放的原因，并建议将审议中国提交的供资申请推迟到稍后的会议，待到掌握更多资料。其他成员表示，必须审慎行事，而且会上就延迟审议中国的供资申请作出何种决定，都不应当危及中国 2020 年削减目标的实现。关于 CFC-11 排放原因的调查目前仍在进行中，这就意味着执行委员会在下结论时需要谨慎。若要收集所有相关信息，需要数年的时间，因此必须澄清哪些信息是必须收集的信息，并考虑为拟进行的收集工作制定明确的时间表。

6. 经过上述讨论，执行委员会决定请中国政府通过相关的执行机构向第八十三次会议提交一份审查报告，根据中国与执行委员会就中国氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划签订的协定审查中国现行的监测、报告、核查和执法制度，其中包括以下两方面的信息：一是国家和地方各级的组织结构和能力，以展示中国如何确保消费和生产行业的氟氯烃淘汰长期可持续性，二是为应对这些物质的任何非法贸易所作努力。执行委员会还请中国政府就为加强消耗臭氧层物质立法和执法而采取的行动提交一份进度报告（第 82/65 号决定和第 82/71 号决定(a)段）。

7. 审查和进度报告将在本文件第一部分进行讨论。

8. 执行委员会第八十二次会议还审议了一份文件，其中载有秘书处的说明，[4] 内容涉及以下问题：能源效率；逐步减少使用氢氟碳化合物的费用准则；以及全球 CFC-11 排放量增加。经讨论后，执行委员会除其他外请秘书处编制一份文件，供第八十三次会议审议，文件将概述在多边基金支持下制定的现行监测、报告、核查和可执行的许可证和配额制度，包括向执行委员会进行报告的各项制度的要求和做法（第 82/86 号决定(c)段）。

9. 根据第 82/86 号决定(c)段，秘书处向第八十三次会议提交了 UNEP/OzL.Pro/ExCom/83/38 号文件，供在议程项目 10 下讨论。执行委员会不妨注意到该

[1] UNEP/OzL.Pro/ExCom/82/45 号文件第 48 至 140 段。

[2] 挤塑聚苯乙烯泡沫塑料行业计划、工业和商业制冷和空调行业计划、制冷维修行业计划和扶持方案以及溶剂行业计划。

[3] UNEP/OzL.Pro/ExCom/82/45 号文件第 141 至 212 段。

[4] UNEP/OzL.Pro/ExCom/82/70。

文件介绍了监测、报告、核查以及可执行的许可证和配额制度，在审议中国政府根据第82/65号和第82/71号决定(a)段提交的报告时或有助益。

二. 关于监测氟氯烃淘汰管理计划第一阶段受援企业泡沫塑料发泡剂消费情况及核查方法的现行制度的案头研究（第82/67号决定(c)段）（世界银行）

10. 在讨论聚氨酯泡沫塑料行业计划第一阶段年度进度报告时，[5] 有位成员表示，需要加强核查企业符合资助条件，特别是针对聚氨酯硬质泡沫塑料行业，确保有关企业并未改变其做法，从而令其获得多边基金支助的资格受到影响。有人建议此种核查是该行业内的最佳做法，认为这是从UNEP/OzL.Pro/ExCom/82/20号文件第24和58段所提供资料（包括未经授权使用氟氯化碳和氟氯烃情况）中学习借鉴并对其作出响应的一种手段。[6] 另一成员表示，需加强核查并制定全面的监测和执行计划。

11. 因此，执行委员会除其他外请中国政府和世界银行为第八十三次会议编制一份关于监测氟氯烃淘汰管理计划第一阶段受援企业泡沫塑料发泡剂消费情况及包括随机抽样在内的核查方法的现行制度的案头研究，以查明这些企业是否曾经或正在消费已淘汰的消耗臭氧层物质（第82/67号决定(c)段）。

12. 关于聚氨酯泡沫塑料行业的案头研究将在本文件第二部分进行讨论。

三. 氟氯化碳生产、哈龙、聚氨脂泡沫塑料、二类加工剂、制冷维修和溶剂行业的财务审计报告（第82/17号决定）（开发计划署、环境规划署、工发组织和世界银行）

13. 在执行委员会第八十二次会议上，[7] 中国政府通过相关的双边机构和执行机构提交了最后进度报告、相关研究报告、技术援助报告和审计报告，其中包括实施氟氯化碳生产、哈龙、聚氨脂泡沫塑料、二类加工剂、制冷维修和溶剂行业计划期间产生的应计利息。执行委员会决定将中国的财务审计报告推迟到第八十三次会议进行审议（第82/17号决定）。

14. 这些行业的财务审计报告将在本文件第三部分进行讨论。

四. 甲基溴消费行业淘汰计划（第82/18号决定(c)段）（工发组织）

15. 执行委员会第八十二次会议审议了关于中国甲基溴消费淘汰国家计划第二阶段执行进度报告。[8] 执行委员会决定请中国政府和工发组织向第八十三次会议提交关于中国甲基溴淘汰国家计划第二阶段的最后报告（第82/18号决定(c)段）。

16. 关于甲基溴消费行业淘汰计划的最后报告将在本文件第四部分进行讨论。

5 UNEP/OzL.Pro/ExCom/82/45号文件第83至101段。

6 关于附有具体报告要求的项目的报告。

7 UNEP/OzL.Pro/ExCom/82/20号文件第4至74段。

8 UNEP/OzL.Pro/ExCom/82/20号文件第79至89段。

五. 甲基溴生产行业淘汰计划（第 82/19 号决定(c)和(d)段）（工发组织）

17. 在其第八十二次会议上，执行委员会审议了关于中国甲基溴生产行业淘汰计划执行情况报告。[9] 经讨论后，执行委员会除其他外决定请中国政府通过工发组织向第八十三次会议提交两份材料，一是关于开发管理信息系统并将该系统纳入待由海关当局实施的监测和监督方案的合同的进度报告，二是关于该工作计划的最新情况，以确保中国在完成甲基溴生产行业淘汰计划之后，继续对甲基溴进行长期、持续监测，包括制定政策和体制安排，展示履约、监测和执行问题（第 82/19 号决定(c)和(d)段）。

18. 该报告和甲基溴生产行业淘汰计划工作计划最新情况将在本文件第五部分进行讨论。

[9] UNEP/OzL.Pro/ExCom/82/20 号文件第 90 至 108 段。

## 第一部分：按照氟氯烃消费和生产淘汰管理计划协定对现行监测、报告、核查和执法制度进行审查（第 82/65 号决定和第 82/71 号决定(a)段）（开发计划署、环境规划署、工发组织和世界银行）

### 背景

19. 开发计划署作为氟氯烃淘汰管理计划的牵头执行机构，代表中国政府提交了一份关于按照氟氯烃消费和生产淘汰管理计划协定对中国政府现行监测、报告、核查和执法制度进行审查的报告。报告内容既包括按照氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划协定对现行的监测、报告、核查和执法制度进行审查，还涉及根据第 82/65 号决定和第 82/71 号决定(a)段的要求为加强消耗臭氧层物质立法和执法所采取行动的进度报告。

20. 该报告全文附在本文件之后。报告共分为五章：

第 1 章：背景和目标

第 2 章：履约框架，包括消耗臭氧层物质管理制度、法律和条例

第 3 章：中国政府氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划下的监测、报告和核查，以及为应对非法贸易和确保氟氯烃淘汰长期可持续性所作努力

第 4 章：对中国政府消耗臭氧层物质执法情况进行审查、查明各项挑战以及旨在加强立法和执法的行动计划

第 5 章：实现即将推出的履约目标的挑战，以及核准氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划付款申请的必要性

### 秘书处的评论意见

21. 秘书处赞赏地注意到中国政府通过开发计划署提交的报告。秘书处审查了该报告，还请中国政府提供补充资料并作进一步澄清，说明现行监测、报告、核查和执法制度以及为加强消耗臭氧层物质立法和执法已采取或打算采取的步骤。

22. 在讨论期间，中国针对秘书处提出的多项意见作了澄清，并提交了补充资料，这些资料随后被开发计划署纳入中国政府提交的经修订的报告（附在本文件附件一之后）。因此，本文件仅反映讨论中提出额外内容、有助于执行委员会对这一事项进行讨论的部分。

23. 秘书处的评论意见分为三个部分：

(a) 总体意见，内容涉及大气监测、测试实验室、加强检查和执法、与业界及其他利益攸关方互动、对使用者的处罚、来源管理、从执法行动中吸取的教训、四氯化碳监测、促进对未遵守条例情事的举报以及将处罚扩展至最终用户；

(b) 与氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划下的监测和报告有关的技术说明；以及

(c) 受控物质非法生产情况报告。

总体意见

24. 在下一节中，秘书处强调了中国政府在加强监测、报告、核查和执法制度方面拟采取的举措，并在某些情况下就如何进一步加强提出意见。

消耗臭氧层物质的大气监测[10]

25. 生态环境部将把消耗臭氧层物质以及氢氟碳化合物纳入其大气监测网络。生态环境部将与中国气象局和其他组织合作，共同开发和管理该监测网络。

26. 中国有 1 000 多个空气质量监测站；测量消耗臭氧层物质（和氢氟碳化合物）的工具可能仅为其中一小部分监测站所需。中国政府计划逐步推进，先是进行研究，然后制定建设方案，在几个主要城市设立试点站，最终在吸取的经验教训的基础上建成长期监测网络。监测站将包括主要城市和背景站。试点城市预计将在 2020 年选定，常规测量计划将在今后两到三年内展开。背景站的规划和建造将于 2021 年启动。中国政府还将把监测中收集到的数据提供给科学研究界。

27. 秘书处认为，中国政府关于将消耗臭氧层物质以及氢氟碳化合物纳入大气监测网络的计划值得称道，是迄今在监测和确保受控物质淘汰可持续性方面探索出的一种有效手段。鉴于该举措的复杂性，秘书处建议中国政府分步行动，为建立网络留足必要时间。秘书处还建议中国政府与卤化碳科学测量界密切协商，建立该网络并确定相应的规程和程序。[11]

建立测试实验室[12]

28. 在中国，只有少数合格的机构能够提供经核证的样本测试报告，这种报告对于对违规企业实行处罚至关重要。因此，生态环境部在 2019 年发布了《关于建立工业产品消耗臭氧层物质监测实验室的通知》，除其他外包括，将建造 6 个消耗臭氧层物质测试实验室并制定相关标准和规格。关于工业产品消耗臭氧层物质的实验室测试标准和规格将在 2019 年底前制定并核证。

29. 有效执法要求对不法行为案件作出裁决。建立 6 个测试实验室，将是加强政府执法能力的一个重要步骤。秘书处注意到，这些实验室目前将重点测试泡沫塑料和预混多元醇，谨建议中国政府今后考虑在必要时扩大对其他产品或设备进行测试的能力。

[10] 相关讨论见中国政府提交的报告第 4.2.5 节。

[11] 关于大气监测的更多信息载于 UNEP/OzL.Pro/ExCom/83/38 号文件。

[12] 相关讨论见中国政府提交的报告第 4.2.5 节。

加强视察和执法

30. 地方生态环境局[13]已经并将继续在消耗臭氧层物质淘汰监测和执法方面发挥关键作用。生态环境局除其他外负责项目完成后对企业合规性进行长期监测。秘书处指出，此项工作对于生态环境局可能是一项挑战，原因有多方面，除其他外包括某些省份中小型企业数量众多；开展监测和视察的能力和资源有限；测试产品及是否存在受控物质的设备有限；在某些地区某一行业可能对当地经济影响重大。在这方面，谨建议生态环境部考虑对少数企业定期进行独立检查并对少量产品进行抽样测试，从而补充地方生态环境局所做的工作：

(a) 关于视察，可从以下方面筛选企业：已在生态环境局进行消耗臭氧层物质消费登记或已获得消耗臭氧层物质配额但不再登记或不再申请配额的企业名单；购买某些原材料（例如，用于生产泡沫塑料的亚甲基二苯基二异氰酸酯；四氯化碳；氢氟酸）的企业；交易者和配方厂家提供的客户名单；以及从市场监督机制和其他来源收集的信息。

(b) 关于产品测试，可对使用消耗臭氧层物质制造并在全国广泛使用的产品（例如，用于新建建筑物的喷射泡沫塑料；新造器具中的泡沫塑料和制冷剂；制冷剂气体容器）进行测试。

来源管理[14]

31. 中国政府计划加强消耗臭氧层物质来源管理，借此防止涉及消耗臭氧层物质的非法行为，并强化监测、报告、核查和执法框架。

32. 秘书处认为这些计划开展的工作值得称赞。为进一步强化监测框架，秘书处建议中国政府考虑监测氢氟酸（此物质是生产所有受控物质所必需的；然而，此物质还可用于生产之外的广泛用途，包括制药、半导体制造等等）和亚甲基二苯基二异氰酸酯（仅用于泡沫塑料制造）的销售和使用情况。中国政府表示，由于氢氟酸和亚甲基二苯基二异氰酸酯是合法产品，因此对其销售和使用进行额外监测不符合中国行政法，因此不得实施。

执法行动[15]

33. 自 2018 年 8 月以来，中国政府启动了消耗臭氧层物质执法专项视察，包括追查非法生产；此外，中国政府还采取了若干专项执法行动，包括“补天”、“地球女神”、“国家之盾”和“绿色围栏行动”。

34. 秘书处赞赏地注意到中国政府为打击非法消耗臭氧层物质行为所作的努力，并认为相关报告证明了中国执行《蒙特利尔议定书》的承诺。秘书处指出，今后如有必要，可将这种专项执法行动和视察纳入定期执法和视察。

[13] 关于生态环境局的作用和责任，在中国政府提交的报告各个部分均有介绍。

[14] 相关讨论见中国政府提交的报告第 4 节。

[15] 相关讨论见中国政府提交的报告第 3.4.1 节。

四氯化碳监测[16]

35. 中国政府计划加强对四氯化碳的监测和报告，除其他外，将在所有氯甲烷企业建立全过程实时监测机制，除其他外包括安装四氯化碳副产品计量表以及测量生产、储存、转换、销售和残留液体中的四氯化碳含量。

36. 秘书处认为，监测氯甲烷生产设施以及下游四氯化碳销售和使用情况的拟用措施将成为加强四氯化碳监测和报告的关键内容。加强四氯化碳监测和报告的价值不言而喻，因为中国政府最近发现的一些非法生产设施能够获得四氯化碳并将其用作生产 CFC-11 的原材料。

37. 但是，秘书处注意到，该监测机制并未将全氯乙烯生产工厂纳入监测范围。许多资料来源[17] 指出，根据生产工序，调整反应条件便可以生产出 100%的纯全氯乙烯或 100%的纯四氯化碳或者两种产品的混合物。截至本文件定稿时，尚不清楚中国的全氯乙烯生产工厂有无使用不同的生产工序来防止四氯化碳的生产或副产。因此，确定生态环境部对全氯乙烯生产工厂的监测是否有益于确保全面监测四氯化碳，还需要补充资料以供参考。在这方面，中国根据第 75/18 号决定(b)段第(三)分段将提交的中国四氯化碳生产和原料应用情况报告[18] 或许将有所助益。

38. 中国政府拟开展的其他活动也将有助于为建立四氯化碳全过程实时监控机制提供依据，这些包括四氯化碳生产和原料用途调查、消耗臭氧层物质销售情况的市场监督和信息收集，以及地方生态环境局消耗臭氧层物质监督和执法的培训和能力建设。谨建议执行委员会注意到，中国政府正提议将二类加工剂项目大约 225 万美元的未用余额用于开展上述若干活动。关于未用余额详情，见本文件第三部分“二类加工剂”一节。该节载有关于中国四氯化碳的实质性技术信息。因此，谨建议执行委员会考虑讨论本文件第三部分下与四氯化碳有关的事项。

促进举报不符合条例情事

39. 在执行《蒙特利尔议定书》能力建设国际讲习班[19] 上，若干与会者指出，执法行动经常受益于受监管行业提出的意见。事实上，业界本身对市场和市场行为体的了解比监管该行业的政府当局更加深入的情况并不罕见。中国的行业协会亦为行业计划参与者，可提

16 相关讨论见中国政府提交的报告第 4.2.1 节。

17 例如，UNEP/OzL.Pro/ExCom/58/50 号文件；“SPARC Report on the Mystery of Carbon Tetrachloride,” SPARC Report No. 7, WCRP-13/2016 ed. Q. Liang, P. A. Newman and S. Reimann，可查阅 https://www.wcrp-climate.org/WCRP-publications/2016/SPARC_Report7_2016.pdf；USEPA 2017, “Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal: Tetrachloroethylene (perchloroethylene)” ，可查阅 https://www.epa.gov/sites/production/files/2017-02/documents/perchloroethylene.pdf；Sherry et al.2018, “Current sources of carbon tetrachloride (CCl4) in our atmosphere,” Environ.Res.Lett.13 024004.

18 该报告将在本文件第三部分中进一步讨论。

19 2019 年 3 月 18 日至 19 日，北京。

供关于行业和企业的信息，同样在监测和执法方面发挥作用。[20] 生态环境部还可邀请行业协会和专家个人参与执法行动，提供现场技术支持。行业协会与企业共享信息，开展宣传和培训，启动鼓励行业合规的举措，可为政府部门提供非法行为线索。

40. 此外，中国根据《环境保护法》开通了环境保护热线（12369），接收关于涉嫌环境违法行为的公众举报。举报信息直接提交给市级生态环境局，并触发下一步措施，如现场考察和样品采集。举报人个人信息受到保护并保密。中国政府将利益攸关方提供的信息视为开展监测和执法的众多线索来源之一。

41. 《消耗臭氧层物质管理条例》（《第 573 号令》）[21] 第 9 条规定，任何单位和个人都有权举报违反该条例的行为，而且规定，接到举报的部门经调查确定情况属实，应对举报人给予奖励。关于前者，虽然第 9 条规定接到举报的部门应为举报人保密，但未明确提到保护举报人免遭报复。对此，中国政府可以考虑列入此类保护措施，作为鼓励举报的一项机制。关于后者，尚不清楚是否确有任何提供线索的个人获得了奖励。对此，中国政府可以考虑公开此类奖励情况，作为一种鼓励举报机制。

### 将对不遵守条例情事的处罚扩展至最终用户[22]

42. 违反《消耗臭氧层物质管理条例》的企业可能会被处以罚款。对此，秘书处建议中国政府考虑将此种处罚扩展至用户，本文件第二部分对此将作进一步讨论。例如，如果喷射泡沫塑料企业将在大型建筑项目中使用违禁物质，可对实施建筑项目的企业予以处罚；如果中小型企业在大型企业（例如超市连锁店）内部安装了一台含有已淘汰消耗臭氧层物质的商用制冷和空调设备，该大型企业也可能受到处罚。此类处罚措施可以激励大型企业确保其供应链中的所有行为体都严格遵守政府规章条例。

### 技术说明

43. 关于氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划下的监测和报告的技术说明分列如下。

### 氟氯烃淘汰管理计划下的监测和报告

44. 所有氟氯烃年消费量超过 100 公吨的企业都必须获得配额，而氟氯烃年消费量低于这一水平的企业不需要配额，但必须在本省生态环境厅登记。随着氟氯烃淘汰管理计划下的氟氯烃淘汰工作不断向前推进，年消费量低于 100 公吨的企业或将日渐成为所有行业消费的主导力量。在与开发计划署讨论时，秘书处建议中国政府考虑逐步调低 100 公吨的阈值，以确保一个行业内的大多数企业都需要获得配额，从而确保按照《协定》控制行业消费水平的配额制度切实有效。开发计划署表示，现行配额制度的有效性已在执行氟氯烃淘

[20] 例如，如本文件第二部分所述，中国塑料加工工业协会进行了一项聚氨酯泡沫塑料行业年度质量平衡分析，将亚甲基二苯基二异氰酸酯总销售额与发泡剂报告用量进行比较，以查出可能存在的出入，供进一步调查。另见中国政府提交的报告第 2.21 和 3.4.2 节。

[21] 见中国政府提交的报告附件一。

[22] 相关讨论见中国政府提交的报告第 3.3.2.2 节和附件一。

汰管理计划期间得到证明，因此中国政府将在氟氯烃淘汰管理计划后续阶段继续实行这一制度。鉴于某些行业中小型企业数量众多，其消费管理颇具挑战，中国还采用了生产行业配额制度，限制可在国内使用的氟氯烃数量。

45. 转赠款协定明确规定，受益企业如果未按照转赠款协定的规定停止使用氟氯烃，或如果继续使用氟氯烃和其他已淘汰消耗臭氧层物质，即被视为违约。到目前为止，尚未发现氟氯烃淘汰管理计划下的受益企业违反了其所签署的转赠款协定，再度使用氟氯烃或其他受控物质。受援企业一经完成技术转换并经过国家验收，监测该企业的责任即移交当地生态环境局，但在氟氯烃淘汰管理计划执行期间和在氟氯烃赠款协定期限内，生态环境部对外合作与交流中心与双边机构和执行机构仍可对企业进行现场考察。在企业经过国家验收后，当地生态环境局便将企业纳入其定期监测和视察方案，并针对已经淘汰或仍受控制的消耗臭氧层物质协调开展专项行动。由于各省情况不同，监测和视察方案可能会有所不同。一般而言，企业通常每年至少接受一次视察。

46. 年消费量超过 100 公吨（因此必须获得配额且已在生态环境部对外合作与交流中心登记）但未经多边基金资助而进行技术转换的企业，在完成技术转换后，无法获得国家验收证书。[23] 根据环境影响评估要求，这些企业的技术转换应当上报当地生态环境局并登记备案，并由当地生态环境局负责对已完成技术转换的企业进行定期监测和视察。

47. 所有受益企业都有义务接受执行机构或其指派机构的视察和核查。根据中国政府与执行委员会的协定规定的要求，执行机构核查通常一年进行一次，核查企业随机选定。在氟氯烃淘汰管理计划第二阶段下，此种核查在生产线上当年已完成技术转换有待核查的企业中随机抽样至少 5%进行，但有一项谅解，即在生产线上随机抽取的样本企业的氟氯烃累积消费量总和至少占当年该行业消费淘汰量的 10%。未获得多边基金供资而进行技术转换的企业未列入此种核查范围。对于这类企业，生态环境部和地方生态环境局将按照《消耗臭氧层物质管理条例》和《2013 年通知》实行配额和登记管理。

48. 与聚氨酯泡沫塑料行业有关的问题，包括对预混多元醇中包含的受控物质的处理、将配方厂家归类为需要配额的企业以及其他事项，将在本文件第二部分中进行讨论。预混多元醇中包含的受控物质不在中国消耗臭氧层物质进出口管理网上审批系统的审批范围，而且在预混多元醇中包含的受控物质出口到其他国家时，政府也没有通过非正式和自愿的事先知情同意机制或通过其他方式，向有关国家发出通知，甚至在这些物质出口到自由贸易区时同样如此。关于预混多元醇中包含的受控物质的出口问题（包括出口到自由贸易区），也在 UNEP/OzL.Pro/ExCom/83/38 号文件中进行讨论。

### 氟氯烃生产淘汰管理计划下的监测和报告

49. 中国政府澄清称，为了实现氟氯烃生产行业的履约指标，除其他外制定了一项可转让生产配额管理制度，只涵盖在氟氯烃生产淘汰管理计划第一阶段核准之时业已设立的企业。在氟氯烃生产淘汰管理计划第一阶段核准之后设立的生产设施既不会分得配额，也无

[23] 例如，在室内空调行业计划第二阶段，一半以上的淘汰将通过未获得多边基金供资的企业进行技术转换来实现。

法获得配额，只允许生产用于原料用途的氟氯烃，不得生产用于受控用途的氟氯烃。用于原料用途的氟氯烃，其生产无需配额。

50. 所有生产企业，不论其所生产的氟氯烃只用于原料用途或受控用途，还是两种用途兼有，都必须按照报告第 3.2.2.3 节的规定报告有关数据，即生产、购买、用于不同用途的详细销售信息（包括销售额、买方和用户）、内部使用、库存以及原材料。原料用户，不论消费水平高低，都必须在生态环境部登记，已登记的用户必须向生态环境部报告在生产流程中用作原料的受控物质的相关信息，生态环境部定期参照生产企业报告的原料销售情况对原料用户报告的原料使用情况进行交叉核对。

关于受控物质非法生产情况的报告

51. 中国政府提交的报告列入以下信息，2010 年至 2018 年上半年，共调查并处罚了 24 起消耗臭氧层物质非法生产案件、44 起非法使用案件和 5 起非法销售案件。有关非法生产案件，有 14 起涉及 CFC-11。约 84 吨非法 CFC-11 已被销毁，生产设施已被拆除，并对非法使用 CFC-11 的四家企业处以罚款。

52. 关于非法生产案件，中国政府在报告之外提供了如下补充资料：

(a) 在涉及 CFC-11 的 14 起案件中，2012 至 2013 年期间发现了 6 起，2014 年发现了 6 起，2015 年发现了 1 起，2017 年发现了 1 起。在 2014 年案件[24]中，四氯化碳和氢氟酸似乎被用作原材料，因为现场除四氯化碳（13.9 公吨）外，还发现了 CFC-11 和 CFC-12。报告共查获 1.2 公吨 CFC-11；未提供关于 CFC-12 数量或结果的信息。由于涉案设施无记录，相关执法机构缺乏技术专长和设备，报告中未提供关于其他已发现非法生产案件的信息，包括产能、CFC-11 已有产量以及所用原材料；

(b) 2015 年，发现了一起非法生产 CFC-12 案件。由于 CFC-11 和 CFC-12 通常由多家企业共同生产，因此不清楚该案中使用的生产工序与涉及 CFC-11 的 14 起案件中所用的生产工序是否不同。未提供关于涉案设施产能、CFC-12 已有产量和 CFC-12 预期用途的信息；

(c) 2014 年发现一起非法生产甲基溴案件；

(d) 2013 年、2014 年和 2017 年共发现三起非法生产氟氯烃案件，这三起案件将在下文进一步介绍；

(e) 由于缺乏非法设施的资料，而且开展视察的相关执法人员的技术专长（包括消耗臭氧层物质识别设备）有限，尚不知道其余五起非法生产消耗臭氧层物质案件所生产或意图生产的物质为何。生态环境部计划为调查机构组织培训，以提高调查人员识别和记录消耗臭氧层物质非法生产的技术能力。

[24] 案件 3 如中国政府所附报告第 31 页所述。

53. 2018 年 8 月以来，又在辽宁省和河南省发现了另两处 CFC-11 非法生产设施。[25] 在这两起案件中，缉获了近 30 公吨 CFC-11 和 177.6 公吨原材料。中国政府确认，这两处设施采用液相氟化工序，以四氯化碳和氢氟酸为原材料，以氯化锑为催化剂。在本文件定稿之时，尚不清楚上述两家企业当初如何购得四氯化碳。

54. 秘书处理解，采用液相氟化工序专门生产 CFC-11（或 CFC-12）在技术上具有挑战性；目前尚不清楚小型非法生产设施是否具备这种能力，包括审慎控制反应条件这项必备能力。最近的科学观察发现，CFC-11 的排放量增加，但 CFC-12 的排放量没有增加。秘书处还注意到，据科学文献报道，东亚地区 CFC-11 排放量增加了 13 000 公吨/年（±5 000 公吨/年）。

55. 关于三起氟氯烃非法生产案件，所提供信息如下：

(a) 2013 年，一家企业对其 HFC-32 设施进行了改造，以非法生产 HCFC-22。该企业计划生产 HCFC-22 为其下游四氟乙烯设施提供原材料（即原料）。该企业受到当地生态环境局的处罚，生产线已被关闭；

(b) 2014 年，一家企业未经批准擅自建起一条 HCFC-22 生产线，以为其下游四氟乙烯和 HFC-125 设施提供原料。该企业受到当地生态环境局的处罚，所有设施全部被关闭；以及

(c) 2017 年，一家非法工厂建立了一个小型 HCFC-141b 设施，生产了约 27 公吨 HCFC-141b。该企业受到处罚，并按照当地生态环境局的要求将其 HCFC-141b 设施拆除并销毁。

56. 从现有的有限资料来看，两起 HCFC-22 生产案件与 HCFC-141b 案件似有不同。后者似乎是一个小型的独立设施，而在前两起案件中，涉案企业似乎具有在下游生产工序中使用氟氯烃作为原料的综合设施，这些设施可能具备大规模生产能力。初步审查中国政府提供的信息发现，在监测涉案设施（包括综合设施）使用氟氯烃作为原料情况时所采用流程类似于世界银行在核查氟氯烃生产情况时所使用方法，除其他外包括现场考察前问卷调查、原材料消费和产品产出比、用作原料的氟氯烃来源、现场库存水平、产品销售数据以及有关生产扩张的任何信息。生态环境部对外合作与交流中心参照氟氯烃生产商报告的销售数据，对原料用户使用的原材料情况进行了交叉核对。此种监测每两年进行一次，由项目执行和监测机构通过氟氯烃生产淘汰管理计划下的技术援助所聘请的独立技术实体实施。此外，秘书处理解，在内部生产氟氯烃并将所生产氟氯烃全部用作原料的综合设施必须登记为氟氯烃生产者而不是原料用户；但是，目前尚不清楚所有这些氟氯烃生产设施是否已在生态环境部登记。由于有关中国政府监测原料用户所用程序的信息有限，秘书处向生产行业分组提出一项建议，请其提供这方面的补充资料。

57. 关于非法转产 HCFC-22 的 HCFC-32 生产设施，目前尚不清楚是对现有设备进行改装还是购置了新设备，也不清楚涉案设施是否在使用现有设备转产 HCFC-22（即只有原

[25] 相关介绍见中国政府提交的报告第 31 和 32 页。

材料[26]和操作条件发生改变）。秘书处不清楚 HFC-32 生产线经改装或在现有基础上转产 HCFC-22 在技术和经济上是否可行，以及其他氟化物生产工序是否同样可以经改装或在现有基础上转产 HCFC-22。在这方面，谨建议中国政府对氟化物生产工序经调整转产 HCFC-22 的技术和经济可行性进行审查，并与执行委员会分享审查结果。

58. 中国自 2010 年以来查明并起诉的非法生产案件此前一直未向执行委员会报告。谨建议委员会注意到，在 UNEP/OzL.Pro/ExCom/83/38 号文件中，秘书处提出了一项请求供委员会审议，即请所有在淘汰受控用途所用消耗臭氧层物质的生产和体制强化方面获得供资的第 5 条国家，除其他外，向秘书处报告有关本国境内发现非法生产案件的任何情况，并请秘书处将此类案件通知执行委员会，以便委员会决定采取何种适当措施或行动。

59. 秘书处如果在第八十三次会议召开之前获得有关中国消耗臭氧层物质非法生产案件的补充资料，将相应地通知执行委员会。

## 结论

60. 秘书处赞赏中国政府提供详细资料说明其监测、报告、核查和执法制度以及为加强这些制度所采取的步骤。中国为加强上述制度拟采取诸多措施，而且总的来说，这些措施都很重要，其中三项尤为有益：

(a) 消耗臭氧层物质大气监测网络一经建立，即会作为一项独立机制运行，供中国政府监测与执行委员会的协定所规定各项目标的推进落实情况。建立和维持该网络需要大量资源，这反映了中国政府对执行《蒙特利尔议定书》的承诺。中国政府承诺将通过大气网络收集的数据提供给科学界，这将促进对大气中卤化碳问题的科学认识和进一步实现《维也纳公约》各项目标；

(b) 到 2019 年底建立 6 个测试实验室，是加强中国政府执法能力的关键一步，届时，现有测试能力有限的问题将迎刃而解；

(c) 中国决定集中精力，投入资源，改进四氯化碳监测。计划建立的氯甲烷企业全过程实时监测机制包括影响深远的措施，这些措施部署到位后，将确保对四氯化碳进行全面和准确的监测。

61. 虽然中国已出台健全的消耗臭氧层物质淘汰监测、报告、核查和执法制度，而且还计划采取额外措施来加强该制度，但秘书处注意到以下情况：

(a) 地方生态环境局在监测和执行消耗臭氧层物质淘汰方面发挥着关键作用。谨建议生态环境部考虑对少数企业定期进行独立视察并对少量产品进行抽样测试，以补充地方生态环境局的工作。将来如有必要，可将这种视察和测试纳入专项执法行动和视察，并可纳入定期执法和视察；

[26] HFC-32 生产以氢氟酸和二氯甲烷为原料，而 HCFC-22 生产以氢氟酸和三氯甲烷（即氯仿）为原料。

(b) 除了改进对氯甲烷设施的四氯化碳监测外，还应当考虑对全氯乙烯生产工厂进行监测；

(c) 应当迅速披露受控物质非法生产情况，因为其中暗藏对这些物质的需求，而且这将有助于执行委员会成员更好地了解中国在如何填补其监测和执法机制中的任何潜在差距；

(d) 鉴于关于某些非法生产案件的现有资料有限，因此有必要对较大综合设施中可能未申报的消耗臭氧层物质生产进行额外调查。此外，更深入地了解如何监测消耗臭氧层物质原料用途也将有所助益；以及

(e) 非法生产案件中也蕴藏着弄清以下问题的机会：涉案设施如何购得四氯化碳等物质；消耗臭氧层物质的预期用途是什么；可能的客户是谁。因此，建议对执法人员进行培训，以查明消耗臭氧层物质生产情况并在发现不符合适用条例情事时保存关键技术信息和数据。

## 秘书处的建议

62. 谨建议执行委员会：

(a) 注意到中国政府按照第 82/65 号决定和第 82/71 号决定（a）段提交的、关于根据中国政府与执行委员会就中国氟氯烃淘汰管理计划和氟氯烃生产淘汰管理计划签订的协定对中国监测、报告、核查和执法现行制度进行审查的报告以及关于为加强消耗臭氧层物质立法和执法所采取行动的进度报告；和

(b) 赞赏地注意到中国政府打算将监测消耗臭氧层物质和氢氟碳化合物纳入其大气监测，而且中国政府承诺将大气监测中收集的数据与科学界分享，[并请中国政府向 2021 年第一次会议提供关于创建该监测网络的最新进展情况]。

## 第二部分：关于监测氟氯烃淘汰管理计划第一阶段下受援企业泡沫塑料发泡剂消费情况及核查方法的现行制度的案头研究（第 82/67 号决定(c)段）（世界银行）

### 背景

63. 世界银行代表中国政府向第八十三次会议提交了关于监测氟氯烃淘汰管理计划第一阶段下受援企业泡沫塑料发泡剂消费情况及包括随机抽样在内的核查方法以确定已经淘汰的消耗臭氧层物质是否曾经或正在这些企业消费的现行制度的案头研究（第 82/67 号决定(c)段）。

64. 案头研究全文附在本文件之后，分为五章：

第一章 导言

第二章 中国聚氨酯泡沫塑料行业的氟氯烃淘汰情况

第三章 为聚氨酯泡沫塑料建立的氟氯烃消费监测系统

第四章 吸取的经验教训

第五章 核查已淘汰物质使用情况的拟用方法

### 秘书处的评论意见

65. 秘书处赞赏地注意到中国政府通过世界银行提交的综合报告，以及中国政府为介绍和分析过去和现在监测和核查消耗臭氧层物质淘汰能力所采取的完整程序，以查明现行制度中的差距和挑战，并提出一种方法，用于核查在弥合这些差距时已淘汰物质的使用情况。

66. 在审查案头研究时，秘书处确认了需要进一步澄清或提供资料的若干领域。虽然讨论了许多澄清事项，但本文件只反映了为讨论后提交的经修订案头研究中所载信息提供了补充要素的讨论方面，可在本文件附件二中查阅全文。

67. 下文补充资料的提供顺序与案头研究章节的顺序相同。

中国聚氨酯泡沫塑料行业的氟氯烃淘汰情况

关于配方厂家在监测、报告和核查中的作用的补充资料

68. 鉴于配方厂家通过为下游用户配制含有发泡剂（受控和替代品）的多元醇在聚氨酯泡沫塑料行业中发挥着重要作用：

(a) 秘书处要求提供补充资料，说明配方厂家在淘汰氟氯化碳和氟氯烃淘汰管理计划中的作用和责任，以及如何对受援和未受援配方厂家的消耗臭氧层物质淘汰情况进行监测。中国政府解释说，在氟氯化碳淘汰期间，只有大约 10

个配方厂家供应预混多元醇。只有在禁用氟氯化碳后 HCFC-141b 渗透到市场，配方厂家业务才在中国蓬勃发展。氟氯烃淘汰管理计划第一阶段开始让配方厂家淘汰 HCFC-141b。在与生态环境部对外合作与交流中心签署的分协定中，配方厂家同意冻结其基准年水平以下的 HCFC-141b 消费量，这将控制 HCFC-141b 的消费并为替代技术的渗透创造激励措施。在行业调查期间，如编制行业计划和中小型企业市场调查期间，配方厂家在提供下游客户信息、鼓励符合资助条件的企业申请供资和提供技术支持方面发挥了重要作用；

(b) 秘书处建议，核查已淘汰物质使用情况的拟用方法应当包括配方厂家在帮助监测和核查消耗臭氧层物质淘汰情况方面可发挥的具体作用。例如，配方厂家可帮助加快和增加企业登记、报告违反协议情况、提高中小型企业对淘汰控制措施的认识以及提供替代技术，并促进引入这种技术。中国政府表示，在氟氯烃淘汰管理计划第二阶段，将为配方厂家提供更多供资和规定更多义务，以淘汰 HCFC-141b 并向下游用户提供技术援助。措施包括但不限于建立替代预混多元醇的生产能力，从基准年开始逐步减少 HCFC-141b，以及向中小型企业客户提供技术援助。将鼓励地方生态环境局与配方厂家进行沟通，并建立其向本地区中小型企业伸出援手的能力；以及

(c) 秘书处建议将配方厂家归类为聚氨酯泡沫塑料企业而不是经销商，以便当其氟氯烃消费量超过 100 公吨而不是超过 1 000 公吨时，可在生态环境部登记。中国政府解释说，不会区别对待，因为按照条例，所有配方厂家都必须在生态环境部或省环境生态厅登记，所有这些配方厂家都须受到监测，并且必须接受生态环境部或省环境生态厅的视察。

69. 秘书处赞赏地注意到，在核查已淘汰物质使用情况的拟用方法中，经修订的案头研究将配方厂家列为下游客户主要资料来源之一，这些资料将用于更新生态环境局保管的聚氨酯泡沫塑料企业登记处。秘书处仍然认为，将配方厂家归类为聚氨酯泡沫塑料企业而不是经销商，将使生态环境部能够更好地了解该行业以及发泡剂和含有受控物质的预混多元醇的流动情况。

关于通过生态环境局监测核查和报告情况覆盖范围的补充资料

70. 根据案头研究和先前关于氟氯烃淘汰管理计划泡沫塑料行业计划第一阶段的进度报告，秘书处指出，生态环境部对外合作与交流中心与生态环境局合作监测消耗臭氧层物质淘汰情况主要集中在 11 个省。[27] 鉴于其他省份有可能也有聚氨酯泡沫塑料中小型企业，秘书处询问为确保其余省份/自治区/直辖市有足够能力在聚氨酯泡沫塑料行业进行消耗臭氧层物质本地管理作了哪些额外努力。在这方面，中国政府解释说：

(a) 尽管在中国所有其他地区分散着聚氨酯泡沫塑料企业和配方厂家，但加强这 11 个重点省市的监测能力受到优先考虑，因为它们占全国氟氯烃消费量的

[27] 广东、河北、河南、江苏、辽宁、青岛、山东、上海、四川、天津、浙江。

90%以上；

(b) 所有省份也在建设当地的消耗臭氧层物质管理能力。地方生态环境局收集了其本区域的消耗臭氧层物质消费数据，在泡沫塑料行业发布了消耗臭氧层物质淘汰政策和信息，为相关项目官员提供了关于消耗臭氧层物质政策和条例的培训，并在相关行业安排现场核查和执法视察。还在各区域组织了公众宣传活动，如关于《消耗臭氧层物质管理条例》及聚氨酯泡沫塑料企业和配方厂家替代技术的讲习班；以及

(c) 在 2018 年 8 月开展的消耗臭氧层物质宣传活动期间，同时在所有省份进行了视察。 事实证明其他省份已经建立了聚氨酯泡沫塑料企业和配方厂家登记处，并实施了涉及调查各个企业的执法措施。氟氯烃淘汰管理计划第二阶段将为需要技术或资金支持的省份提供进一步援助，并密切关注报告任何非法使用已淘汰消耗臭氧层物质的迹象或案件的地区。将定期为地方生态环境局官员举办讲习班。

71. 秘书处赞赏地注意到关于所有生态环境局的能力在逐渐增强的补充资料，特别是在没有实施多边基金项目且所进行监测工作曝光程度可能较低的地方。秘书处认为，列入氟氯烃淘汰管理计划第二阶段聚氨酯泡沫塑料行业计划中的技术援助活动可能有助于提高制造聚氨酯泡沫塑料所在地所有生态环境局的能力。秘书处建议考虑建立一个省际生态环境局官员网络，以在消耗臭氧层物质管理方面开展信息交流和进行能力建设，所采用模式类似于环境规划署实施的臭氧官员区域网络采用的模式。中国政府对这一建议表示赞赏，承认需要加强区域间信息交流。

便利举报聚氨酯泡沫塑料行业不遵守条例情事的机制

72. 正如本文件第一部分所述，秘书处鼓励中国政府继续发展和促进举报人保护机制，以确保安全举报不遵守消耗臭氧层物质条例情事，并继续提高业界对非法行为所导致的环境后果和守法企业因此所处的竞争劣势的认识。

将聚氨酯泡沫塑料行业不遵守条例的处罚扩展至最终用户

73. 考虑到核查已淘汰物质使用情况的拟用方法包括加大对违法行为的处罚力度，秘书处询问中国政府是否考虑将处罚扩展至用户（例如，大型建筑项目应对所使用材料负责，包括喷射泡沫塑料中的发泡剂）。中国政府表示很难对最终用户进行处罚，因为它们通常无法检测产品中包含的成分。最终用户购买产品和（或）服务，并依赖供应商提供的质量保证。现行的消耗臭氧层物质立法和政策制定了消耗臭氧层物质生产、使用、销售、进口和出口的全过程管理制度。

74. 秘书处同意大多数最终用户需要依赖供应商提供的质量保证。关于较大的最终用户，如大型建筑项目，秘书处未得到其他第 5 条国家执行禁止使用发泡剂禁令方面任何具体措施的资料（例如，对大型最终用户的最终产品进行现场视察）。然而，要注意的是，拟用方法包括对消耗臭氧层物质用户（泡沫塑料生产商）和经销商的泡沫塑料产品进行抽样。在编制本文件可用的时间内没有进一步讨论这个问题。

与预混多元醇中包含的消耗臭氧层物质有关的法律条例

75. 秘书处要求澄清为管理和监测中国的消耗臭氧层物质落实到位的一整套综合法律、条例、规则和政策中如何考虑预混多元醇中包含的消耗臭氧层物质。中国政府解释说，根据其细则和条例，特别是生态环境部发布的《2013 年通知》，消费预混多元醇中包含的氟氯烃的企业被视为氟氯烃消费者，因此，如果预混多元醇中包含的氟氯烃超过每年 100 公吨，则必须申请消费配额，如果氟氯烃低于每年 100 公吨，则必须在省生态环境厅登记。配方厂家还必须在生态环境部登记（如果其氟氯烃消费量超过每年 1 000 公吨）或在省生态环境厅登记（如果低于每年 1 000 公吨），这取决于根据其销售量，并且必须保留其销售记录。记录可以表明预混多元醇的销售地点。但是，由于整个供应链的复杂性以及不同级别交易者参与的可能性，很难仅根据单个配方厂家的记录准确区分国内销售与出口。报告的若干部分指出预混多元醇已列入监测行动，特别是在现场视察方面。

76. 秘书处注意到，这些条例同等对待氟氯烃和预混多元醇中包含的氟氯烃。因此，应当以与氟氯烃出口相同的方式追查预混多元醇中包含的氟氯烃的出口，包括出口配额。因此，秘书处建议中国政府考虑开发一个系统，以更好地识别、记录、控制和报告含有受控物质的预混多元醇的出口，并将预混多元醇中包含的消耗臭氧层物质纳入非正式事先知情同意机制，如果还没有这样做的话。虽然这超出了中国消耗臭氧层物质淘汰的监测、报告和核查范围，但它在其他国家的监测、报告和核查方面具有价值。

关于受援氟氯化碳企业签署的转赠款协定中违反合同的规定

77. 秘书处要求澄清在氟氯化碳淘汰方面受援企业签署的转赠款协定是否也包含违反合同规定，以及是否曾用过此类规定（例如，在氟氯烃淘汰管理计划下，最高罚款为转赠款协定额的 10%以下、如果受益企业不停止或重新使用 HCFC-141b 将中止转赠款协定并将援助退还）。中国政府澄清，违反合同规定也载入氟氯化碳淘汰行业计划的转赠款协定，迄今尚未查到氟氯化碳行业计划或氟氯烃淘汰管理计划下的受益人违反转赠款协定的情况。“在受益人未严格履行本合同规定的义务、责任、陈述和保证的情况下”，受益人将被视为违反合同。同意停止使用消耗臭氧层物质的承诺函附在转赠款协定之后。此项合同义务不是确保企业停止使用并且不重新使用消耗臭氧层物质的唯一措施。地方生态环境局和生态环境部不会向已完成技术转换次级项目的企业发放氟氯烃配额或进行登记。没有获得氟氯烃配额或登记，企业如果重新使用氟氯烃，就会违反消耗臭氧层物质细则。

78. 秘书处注意到该系统确保具有转赠款协定的企业在完成替代品技术转换后仍然遵守消耗臭氧层物质条例。对于没有得到多边基金援助因此没有订立转赠款协定的其他企业，由生态环境局对其进行登记，这将确保它们由监测系统所涵盖。

关于已查明的非法使用消耗臭氧层物质案件的补充资料

79. 中国政府在向秘书处提供关于已查明的非法使用 CFC-11 案件的补充资料时表示：

(a) 非法生产和使用 CFC-11 的一个主要原因是氟氯化碳和配方成本低，这降低了最终产品的价格，因为使用 CFC-11 的生产工序相对简单，且技术难度门槛低；

(b) 被发现有 CFC-11 痕迹的聚氨酯泡沫塑料企业和配方厂家均未得到多边基金援助；以及

(c) 如果发现配方厂家有 CFC-11 痕迹，在现行监测制度下，环境视察员将开启追查氟氯化碳供应商和预混多元醇客户的程序。

为聚氨酯泡沫塑料建立的氟氯烃消费监测系统及吸取的经验教训

80. 关于现行监测系统与氟氯化碳监测系统之间的主要差异，除了已载入案头研究第 22 至 27 段和第 72 至 79 段的资料外，中国政府提出以下内容：

(a) 氟氯化碳监测的一个差距是缺乏登记和追查使用消耗臭氧层物质的企业的系统程序。这是主要经验教训之一，因此在氟氯烃淘汰期间纳入了企业追查系统；

(b) 另一个主要区别是，通过现场样品采集、发泡剂探测器和测试中心开发，正在加强对监测能力的支持；

(c) 追查使用消耗臭氧层物质的企业的系统程序和改进适用于氟氯烃和氟氯化碳的监测和执法能力；以及

(d) 另一个重要的经验教训是需要在宏观层面上进行定期检查，以查明泡沫塑料发泡剂的消费量是否与正在制造的泡沫塑料相当。

与配方厂家和聚氨酯泡沫塑料企业登记有关的问题

81. 案头研究介绍了监测已登记企业消耗臭氧层物质淘汰情况的综合系统。但是，根据案头研究中的资料，能够推测出未登记企业（特别是中小型企业）的数量庞大。此外，案头研究还表明（第 26 段），在氟氯化碳淘汰时系统程序还没有到位以登记和追查使用消耗臭氧层物质的企业。秘书处认为，通过涵盖迄今尚未登记的大量企业，监测聚氨酯泡沫塑料行业中消耗臭氧层物质淘汰情况的系统可得到进一步加强。

82. 关于这一事项的讨论摘要如下：

(a) 中国政府承认，省生态环境厅和地方生态环境局需要修改其清单和数据库，不仅列入仍在使用氟氯烃的企业，还列入已经淘汰消耗臭氧层物质的企业。中国政府已将现有登记处升级为核查淘汰物质使用情况拟用方法的一部分，但承认在各省采用这项措施还需要时间。作为该方法的一部分，鼓励生态环境局通过当地工业（包括配方厂家）和商业管理部门、互联网搜索、调查和其他类型侦察共享的商业登记信息扩大其登记处；

(b) 为了帮助应对已确定的加快创建登记处方面的挑战，秘书处要求澄清处罚未登记企业 20 万元罚款是否会成为尚未登记的企业进行登记的一种激励措施。中国政府解释说，由于一些省份的登记程序仍在落实中而且是新的，任何时候自愿提出请求的企业都可以免缴罚款；以及

(c) 为了创建更全面的登记处，秘书处还询问中国政府是否考虑过建立聚氨酯泡沫塑料企业/配方厂家登记处，而不是氟氯烃用户登记处。中国政府澄清说，中国的消耗臭氧层物质条例只能提及受控物质，而某一行业不能仅仅因为它是一个行业而受到监管。因此，当氢氟碳化合物在中国变成受控物质时，将有要求登记的法定任务。

关于生态环境局进行现场视察的现行制度的补充资料

83. 关于现行的生态环境局在项目完成后视察企业的规程（每年视察次数、挑选待视察企业的标准、视察方法、确定涉嫌违规行为的标准、每年抽样的类型和数量），中国政府解释说，各生态环境局根据具体情况制定了不同的监测工作计划，包括本地区的企业集中程度、企业地理分布和优先行业。

84. 关于世界银行作为聚氨酯泡沫塑料行业执行机构的作用：

(a) 只要总体项目赠款协定到位，世界银行也可以视察国家验收后国家验收年限已经结束的企业。例如，根据第一阶段的聚氨酯泡沫塑料行业计划，所有技术转换都在 2018 年底完成，但世界银行可以与生态环境部对外合作与交流中心合作组织考察，直到 2019 年中期赠款协定到期。每年大约考察 5 到 10 家企业；以及

(b) 世界银行关于环境和社会保障措施的规定确保将一个减轻环境影响并确保在实施到完成期间可持续淘汰的机制落实到位，并通过国家监管和完成后确保可持续性的程序接管该系统。

核查已淘汰物质使用情况的拟用方法

关于生态环境局进行现场视察的拟议制度的补充信息

85. 核查已淘汰物质使用情况的方法建议，虽然聚氨酯泡沫塑料行业计划第二阶段仍在进行，但生态环境部对外合作与交流中心和（或）世界银行将在技术转换前一年或更早对至少 10%的聚氨酯泡沫塑料企业进行随机考察。此外，秘书处建议，在聚氨酯泡沫塑料行业计划第二阶段结束时，生态环境部对外合作与交流中心和（或）世界银行至少在两年前对 5%完成国家验收的企业进行随机考察，以确保它们没有使用消耗臭氧层物质，并核查它们是否仍在使用商定的替代品。中国政府保证，这可以通过确保某些企业是第一批完成技术转换的企业，在 10%的原提案中完成。

86. 秘书处要求对特定生态环境局辖区内所有聚氨酯泡沫塑料企业和配方厂家提出的年度视察费用进行总体估算，指出企业的现场视察费用为 500 美元另加取样费 450 美元、测试样品费 120 美元。中国政府报告称，根据对全国 100 多家配方厂家和 2 000 多家聚氨酯泡沫塑料企业的估算，每年的视察费用估计为 225 万美元左右。

关于拟分配给生态环境局的发泡剂即时探测器的补充细节

87. 秘书处同意，使用最近推出的拟供生态环境局使用的发泡剂即时探测器可使现场视察和样品分析过程更具成本效益。应秘书处的要求，中国政府报告说，即时探测器是手提箱大小而不是手提式的，它们能够测试泡沫产品、发泡剂和预混多元醇的成分。在测试时，收集的样品通过进料口放入探测器。然后，探测器通过气相色谱对样品中包含的化学品生成测试图。根据化学品的不同峰值时间，可以初步筛查发泡剂的成分，包括 CFC-11、HCFC-141b、HFC-245fa 和环戊烷。测试一种样品的过程通常需要大约 20 分钟。探测器的成本为 20 000 美元左右。秘书处注意到，将用氟氯化碳聚氨酯泡沫塑料、溶剂、生产和制冷维修计划的余额采购和分发约 35 个探测器。[28]

88. 关于氟氯烃淘汰管理计划进度报告是否将包括生态环境局正在开展的这些监测、视察和执法行动的结果，中国政府表示，氟氯烃淘汰管理计划进度报告将按照其与执行委员会的协定，全面反映在报告所述期间氟氯烃淘汰管理计划的执行进度。正如秘书处关于氟氯化碳、四氯化碳和哈龙行业计划（本文件第三部分）财务审计的评论意见所示，秘书处支持使用其中某些行业所指出的未用余额向生态环境局供应消耗臭氧层物质即时探测器，但有一项谅解，中国政府将继续在今后的财务审计报告中报告地方生态环境局监测工作的成果，包括检测到 CFC-11 的情况。一旦列入财务审计项目的所有未用余额已经发放并且这些项目已经完成，秘书处建议中国政府继续在氟氯烃淘汰管理计划聚氨酯泡沫塑料行业年度进度报告下进行此类报告。

泡沫塑料行业中平衡原材料的方法

89. 秘书处赞赏地注意到泡沫塑料行业中平衡原材料以推断出发泡剂总量的方法，该方法每年提出。这种方法可以加强中国政府的泡沫塑料发泡剂监测系统，并支持采用核查方法来澄清已经淘汰的消耗臭氧层物质是否仍在消费。但是，秘书处不确定分析得出的数据是否非常准确，足以能够核实市场上是否有额外的泡沫塑料发泡剂。特别是，多元醇中包含的发泡剂的成分有变化（随着用途而变化），可能会对发泡剂的使用产生可能的不确定性（例如，虽然 HCFC-141b 或氢氟碳化合物的使用可能众所周知，但其他发泡剂的精确消费则更加不确定）。有鉴于中国聚氨酯硬质泡沫塑料的年产量（每年约 170 万公吨），这些不确定性可能会变大。尽管如此，秘书处认为，该分析将有益于检测出可以进一步调查的趋势变化，而不是提供独立的核查方法。

90. 此外，还讨论了以下相关问题：

(a) 秘书处建议监测计量吸入器的销售和使用情况，以便能够建立和维护聚氨酯泡沫塑料企业和配方厂家（而不是氟氯烃用户）登记处。中国政府表示已开展信息交流，并收集和分析了计量吸入器的销售数据。关于计量吸入器销售的管理问题，如前所述，中国政府可责成企业报告的内容有局限性，特别是那些不使用消耗臭氧层物质因此不受消耗臭氧层物质条例管制的企业；

[28] 参考本报告第三部分秘书处的评论意见。

(b) 按照要求，中国政府还确认，可参照配方厂家和获得配额或在生态环境局登记的企业提供的资料对从质量平衡分析中获得的资料进行交叉核对，以便对市场在较为宏观层面上的表现提供比较全面的了解。 这还包括 HCFC-141b 的产量；

(c) 关于这种方法是否有助于检测出该行业是否在普遍非法使用 CFC-11，中国政府表示，这是监测是否在普遍使用未知发泡剂的一种方法，但据了解它无法帮助检测出被禁和非法消耗臭氧层物质的孤立事件。原材料质量平衡法可以表明聚氨酯泡沫塑料的整体生产情况，并且有助于交叉核对该行业的发泡剂。但是，鉴于市场上在使用氢氟碳化合物、水发泡配方和氢氟烯烃等不同的替代品，检测到的出入不能直接转化为氟氯化碳的非法用量。拟用方法起到警报系统的作用，当检测出偏差时触发进一步调查。

## 结论

91. 秘书处赞赏中国政府编写的案头研究中所载的核查已淘汰受控物质使用情况的详细资料和拟用方法，以及上文所反映的进一步澄清和对所提出问题的公开讨论。秘书处认为，在消耗臭氧层物质监管框架、负责监测机构的能力以及与利益攸关方合作方面，多年来监测、报告和核查聚氨酯泡沫塑料行业消耗臭氧层物质淘汰规定遵守情况的系统得到了加强。这一方法可以继续得到加强和扩展，以覆盖更多企业。更好地了解非法生产的发泡剂的需求和消费者将是有益的。正如讨论中所述，秘书处的一些意见已经被纳入整个监测系统，或者正在得到考虑以继续加强该系统。有关其他意见，中国政府表示这些意见更难以落实。

92. 秘书处的意见摘要如下：

(a) 监测聚氨酯泡沫塑料行业消耗臭氧层物质淘汰情况的既定程序对于已登记的聚氨酯泡沫塑料企业和配方厂家是有效的。其他聚氨酯泡沫塑料企业和配方厂家登记，特别是那些从未获得过多边基金援助的企业和中小型企业登记，将有助于扩大监测系统的覆盖范围。案头研究中提出的加速其他企业登记的措施是一个优先事项；

(b) 需要强化配方厂家在确定和向生态环境局提供中小型企业资料方面的作用。这也有助于改进企业登记处。在执行氟氯烃淘汰管理计划聚氨酯泡沫塑料行业第二阶段过程中更系统地纳入配方厂家，将加强其向下游用户提供援助的能力，同时帮助生态环境局对其进行确认和监测。秘书处认为，将配方厂家分类为聚氨酯泡沫塑料企业而不是经销商，将帮助生态环境部更好地了解该行业以及发泡剂和含有受控物质的预混多元醇的流动情况；

(c) 由于迄今大多数工作都集中在占消费量 90%的 11 个省份，因此，建设所有生态环境局的能力至关重要，无论制造和使用聚氨酯泡沫塑料活动是在何处。拟用方法包括氟氯烃淘汰管理计划聚氨酯泡沫塑料行业计划第二阶段下的跨区域合作和技术援助活动，这也将有助于强化生态环境局以进行监测和执法活动，但有一项谅解，一旦建立了能力，生态环境局应为政府确认的例行监测活动分配预算；

(d) 秘书处建议中国政府继续发展和促进举报人保护机制，以确保安全举报不遵守消耗臭氧层物质条例情事，并继续提高业界对非法行为所导致的环境后果和守法企业因此所处的竞争劣势的认识；

(e) 谨建议中国政府考虑让大型最终用户更多地参与监测和核查活动是否有益，无论是通过确保其项目所用材料的问责制还是通过进行现场视察，以及除对聚氨酯泡沫塑料企业和配方厂家进行拟议视察外，还对大型最终用户的最终产品进行抽样；

(f) 秘书处建议中国政府考虑建立一个系统，以更好地确认、记录、控制和报告含有受控物质的预混多元醇的出口情况，如有可能利用该系统在非正式和自愿的非正式事先知情同意机制下进行报告；

(g) 正如 UNEP/OzL.Pro/ExCom/83/38 号文件所指出的，请建议执行委员会澄清所有接受多边基金援助并生产或进口受控物质将其混合在预混多元醇中供出口的第 5 条国家应当报告此类出口情况，查明预混多元醇出口到哪个国家或哪些国家以及其中含有的消耗臭氧层物质的各自数量；以及

(h) 聚氨酯泡沫塑料行业中平衡原材料的方法可以强化中国政府的泡沫塑料发泡剂监测系统，并为核查方法提供支持，以澄清已经淘汰的消耗臭氧层物质是否仍在消费。秘书处认为监测计量吸入器的销售和使用情况也将提供有用的参考资料，并且有助于维护聚氨酯泡沫塑料企业和配方厂家（而不是氟氯烃用户）登记册。

93. 秘书处注意到上述意见，支持案头研究中提出的核实聚氨酯泡沫塑料行业已淘汰物质使用情况的拟用方法，并支持努力提高登记、现场视察和测试能力。秘书处建议中国政府继续在今后的财务审计报告中报告地方生态环境局监测工作的结果，包括检测到 CFC-11 的情况，一旦列入财务审计的项目下所有未用余额已经发放，且这些项目已经完成，继续在氟氯烃淘汰管理计划聚氨酯泡沫塑料行业第二阶段年度进度报告下进行这种报告。

## 秘书处的建议

94. 执行委员会不妨：

(a) 赞赏地注意到 UNEP/OzL.Pro/ExCom/83/11/Add.1 号文件所附的关于监测氟氯烃淘汰管理计划第一阶段下受援企业的泡沫塑料发泡剂消费情况及核查方法的现行制度的案头研究，以澄清已淘汰的消耗臭氧层物质是否曾经或正在这些企业消费；和

(b) 审议执行委员会可能建议的任何补充指导意见，以便根据 UNEP/OzL.Pro/ExCom/83/11/Add.1 号文件第 92 段中的意见实施聚氨酯泡沫塑料行业计划第二阶段。

## 第三部分: 中国氟氯化碳生产、哈龙、聚氨酯泡沫塑料、第二类加工剂、制冷维修及溶剂行业的财务审计报告

### 背景

95. 根据第 71/12（b）（二）和（三）号[29]、第 72/13 号[30]、第 73/20（b）号[31]、第 75/18 号[32]、第 77/26（b）[33]和第 80/27 号[34]决定，中国通过相关双边和执行机构向第八十二次会议提交了最后进度报告、相关研究报告、技术援助报告和审计报告，包括在执行氟氯化碳生产、哈龙、聚氨酯泡沫塑料、第二类加工剂、制冷维修和溶剂行业计划过程中产生的利息。

96. 在第八十二次会议上，执行委员会决定推迟到第八十三次会议审议中国氟氯化碳生产、哈龙、聚氨酯泡沫塑料、第二类加工剂、制冷维修和溶剂行业的财务审计报告（第 82/17 号决定）。因此，中国政府通过相关执行机构向第八十三次会议提交了在第八十二次会议提交的截至 2019 年 4 月的最新情况。

97. 为了呈现自第八十二次会议以来的最新情况，秘书处使用在第八十二次会议使用的同一文件，[35]包括以粗体表示的审查更新后的报告相关的新案文。

计划编制的预算和进度报告

98. 截至 2018 年 8 月 31 日，所剩余额为 22,236,071 美元。**截至 2019 年 2 月 28 日，所剩余额已减至 15,498,653 美元。**表 1 概述 **2018 年 8 月 31 日至 2019 年 2 月 28 日**发放的资金、资金结余以及每个行业计划计划完成日期。

[29] 委员会邀请政府通过相关执行机构在今后的财务审计报告中提供政府为发放给第二类加工剂、溶剂和制冷维修行业计划的受益方所掌握的所有资金及其余额所产生的利息的数据；以及与行业计划的工作计划相关的进度及如何使用可能结余的提案的信息。

[30] 委员会邀请中国政府通过相关执行机构向第七十三次会议提交关于第二类加工剂、溶剂和氟氯化碳制冷维修行业的财务审计报告，同时提交关于哈龙、氟氯化碳生产、泡沫塑料、第二类加工剂、溶剂和氟氯化碳制冷行业的剩余资金的使用计划，说明中国政府将如何在淘汰相关消耗臭氧层物质的活动中使用这些剩余资金，以便到 2018 年年底完成这些行业计划。

[31] 政府和相关双边机构和执行机构需要在 2018 年 12 月 31 日以前提交年度进度报告、审计报告以及氟氯化碳生产、哈龙、聚氨酯泡沫塑料、第二类加工剂、制冷维修和溶剂行业计划执行期间所产生的利息，并在 2019 年第一次会议以前提交行业计划的项目完成报告。

[32] 邀请政府在完成这些活动后提交的报告中列入关于筛选和评价不含氟氯化碳的替代品以及开发新的替代品的活动的结果；收集关于哈龙回收的信息，作为在访问拆船中心期间收集关于氟氯化碳回收的信息的一部分；对其国家生产四氯化碳及其用于原料的应用进行研究，并在 2018 年底之前向委员会提供研究结果。

[33] 政府需要向第七十九次会议提交多边基金为氟氯化碳生产行业提供的资金进行的所有研发项目的最后研究报告。

[34] 委员会赞赏地注意到政府已确认到 2018 年底将完全支付与每个行业计划有关的资金余额；相关的研究和技术援助报告将提交 2018 年的最后一次会议，项目完成报告将提交 2019 年的第一次会议。

[35] UNEP/OzL.Pro/ExCom/82/20 号文件第一部分。

**表 1. 使用剩余资金的计划预算（美元）**

| 活动 | 截至 2018 年 8 月 31 日的结余 | 新的资金发放 | 截至 2019 年 2 月 28 日的结余 | 完成日期 |
|---|---|---|---|---|
| **氟氯化碳生产：核准总额 150,000,000 美元（世界银行）** | | | | |
| 征聘技术支助人员，举办替代技术研讨会 | 0 | **0** | **0** | 2014 年 |
| 消耗臭氧层物质进出口管理信息系统 | 0 | **0** | **0** | 2015 年 |
| 研究和开发消耗臭氧层物质替代品 | 420,089 | **368,655** | **51,434** | **2019 年** |
| 监督和管理 | 199,765 | **29,465** | **170,300** | **2019 年** |
| 共计 | **619,853** | **398,120** | **221,733** | |
| **哈龙行业：核准资金总额 62,000,000 美元（世界银行）** | | | | |
| 建立国家哈龙回收管理中心，包括能力建设、检测设备和信息系统 | 1,975,083 | **438,368** | **1,536,715** | 2022 年 |
| 建立哈龙-1211 回收中心，包括收集、运输、回收和再生 | 3,017,686 | **0** | **3,017,686** | 2022 年 |
| 建立哈龙-1301 回收中心，包括收集、运输、回收和再生 | 1,039,530 | **0** | **1,039,530** | 2022 年 |
| 技术援助：调查用于民用航空业和船舶回收业的哈龙数量；以及哈龙回收的政策和法规 | 2,917,936 | **0** | **2,917,936** | 2022 年 |
| 处理不可用的哈龙和残留物 | 1,504,105 | **0** | **1,504,105** | 2022 年 |
| 共计 | 10,454,340 | **438,368** | **10,015,972*** | |
| **第二类加工剂：核准资金总额 46,500,000 美元（世界银行）** | | | | |
| 当地生态和环境局的能力建设 | 288,357 | **280,000** | **8,357** | 2018 年 |
| 研究消耗臭氧层物质替代物和推动发展替代技术的趋势 | 62 | **0** | **62** | 2018 年 |
| 处理四氯化碳残留物 | 5,445,970 | **3,228,084** | **2,217,886** | **2019 年和 2020 年**** |
| 四氯化碳的生产及其用于原料应用的研究 | 89,417 | **10,412** | **79,005** | **2019 年和 2020 年**** |
| 监测、管理和事后评价 | 1,458,721 | **36,081** | **1,422,640** | **2019 年和 2020 年**** |
| 共计 | 7,282,527 | **3,554,577** | **3,727,950** | |
| **聚氨酯泡沫塑料： 核准资金总额 53,846,000 美元（世界银行）** | | | | |
| 筛选和评估无氟氯化碳的替代品和开发新的替代品 | 270,935 | **270,935** | **0** | 2018 年 |
| 其他省级泡沫塑料活动（11 个省的能力建设） | 490,812 | **290,812** | **200,000** | **2019 年 6 月** |
| 为泡沫塑料企业提供技术服务，以更好地应用新的替代品 | 375,377 | **375,377** | **0** | 2018 年 |
| 继续监测泡沫塑料行业淘汰氟氯化碳的情况 | 370,373 | **273,393** | **96,980** | **2019 年 3 月** |
| 项目监测和管理 | 147,901 | **147,901** | **0** | 2018 年 |
| 共计 | 1,655,398 | **1,358,419** | **296,980** | |
| **制冷维修：核准资金总额 7,884,853 美元（日本、环境开发署、工发组织）** | | | | |
| 正在进行的活动（例如，八个培训中心、培训拆船行业、深圳示范项目） | 9,124 | **9,124** | **0** | 2018 年 |
| 工业和商业制冷/制冷和空调次级行业的培训方案 | 551,849 | **146,194** | **389,731** | **2019 年 6 月** |
| 研究 R-290 制冷和空调的维修和运行中制冷剂的泄漏 | 282,040 | **0** | **282,040** | 2018 年 |
| 数据调查 | 80,552 | **80,552** | **0** | 2018 年 |
| 监测和管理 | 95,846 | **95,846** | **0** | 2018 年 |
| 监测消耗臭氧层物质的能力建设（重新分配用于培训活动的资金） | 0 | **0** | **15,924** | **2019 年 6 月** |

| 活动 | 截至 2018 年 8 月 31 日的结余 | 新的资金发放 | 截至 2019 年 2 月 28 日的结余 | 完成日期 |
|---|---|---|---|---|
| 共计 | 1,019,411 | **331,716** | **687,695** | |
| **溶剂行业：核准资金总额 52,000,000 美元（开发计划署）** | | | | |
| 打击消耗臭氧层物质的非法活动：10 个地方海关的能力建设 | 522,765 | **69,646** | **453,119** | 2019 年 6 月 |
| 14 个省的消耗臭氧层物质相关人员的能力建设 | 340,000 | **340,000** | **0** | 2018 年 |
| 公众意识和宣传活动 | 0 | **0** | **0** | 2018 年 |
| 替代技术的评估和研究 | 0 | **0** | **0** | 2017 年 |
| 电子文件管理系统 | 92,307 | **0** | **92,307** | 2019 年 6 月 |
| 活动管理和监测 | 249,470 | **246,573** | **2,897** | 2019 年 6 月 |
| 共计 | 1,204,542 | **656,219** | **548,323** | |
| **总结** | | | | |
| 氟氯化碳生产（150,000,000 美元 – 世界银行） | 619,853 | **398,120** | **221,733** | **2019 年** |
| 哈龙行业（62,000,000 美元 – 世界银行） | 10,454,340 | **438,368** | **10,015,972** | **2022 年** |
| 第二类加工剂（46,500,000 美元 - 世界银行） | 7,282,527 | **3,554,577** | **3,727,950** | **2020 年** |
| 聚氨酯泡沫塑料（53,846,000 美元 – 世界银行） | 1,655,398 | **1,358,419** | **296,980** | **2019 年** |
| 维修（7,884,853 美元 – 日本、环境开发署、工发组织） | 1,019,411 | **331,716** | **687,695** | **2019 年** |
| 溶剂（52,000,000 美元 – 开发计划署） | 1,204,542 | **656,219** | **548,323** | **2019 年** |
| **共计** | **22,236,072** | **6,737,419** | **15,498,653** | |

*** 在 1,002 万美元结余中，238 万美元用于正在进行的活动。目前尚未支用的 764 万美元将用于哈龙-1211 回收中心的建立和运营、哈龙-1301 回收业务、哈龙回收站的能力建设、哈龙检测仪器的采购、回收哈龙的政策和法规研究、调查中国关键地区的哈龙数量和处置无法使用的哈龙和残留物。**

**** 合同中未完成的活动预计将于 2019 年 12 月完成。建议将剩余的未分配余额约 225 万美元重新分配给消耗臭氧层物质的长期监测和管理工作。这些活动将于 2020 年 12 月以前完成。**

99. 进度报告包括截至 **2019 年 2 月 28 日**的资金发放情况。截至 2018 年 6 月 30 日的资金发放财务审计由大信会计师事务所根据国家标准进行。审计意见认定氟氯化碳生产、哈龙、四氯化碳加工剂、聚氨酯泡沫塑料、溶剂和制冷维修行业的赠款和支出报表都符合《蒙特利尔议定书》的规则和中国的会计标准，并已由**中国国际环境合作中心**/生态与环境部（IECO/MEE）正式提交。**没有委托对 2018 年 6 月 20 日之后的支出进行财务审计，下一次财务审计将涵盖 2018 年 7 月 1 日至 2019 年 6 月 30 日期间的支出。**

100. 以下概述 2017 年 7 月 1 日以来每个行业计划实施的活动。

氟氯化碳生产行业

101. 自 2015 年以来，氟氯化碳生产行业计划中唯一剩余的活动是消耗臭氧层物质替代品的研发以及监督和管理。**在第八十次和第八十二次会议之间**共发放了 402,414 美元。**自第八十二次会议以来，又发放了 398,120 美元。**剩余的资金 **221,733 美元**预计将在 **2019 年**底前发放。

102. 关于消耗臭氧层物质替代品的研发，已经选定了 13 项提案，所有这些提案都已完成；**十二项已经通过项目验收**，最后一项（北京化工大学关于 HFO-1234yf 和 HFO-1234ze 在实验室的新生产过程）**预计将于 2019 年 6 月进行项目验收。自第八十二次会议以来，已发放了 368,655 美元，最后一笔 8,050 美元将在最后一个项目完成项目验收后发放。由**

**于合同签订和付款之间出现的货币波动，共结存了未分配余额 43,484 美元，中国政府建议将其用于购买监测消耗臭氧层物质的仪器，以建立地方生态和环境局（EEBs）的能力并实现可持续淘汰氟氯化碳的规定。**

103. 为监督和管理共发放了 233,411 美元。中国国际环境合作中心已经发放了 **63,111 美元**[36]，用于制作管理消耗臭氧层物质进出口的视频培训材料（**32,073 美元，剩余合同价值 88,080 美元**）、用于 **2019 年 1 月 21 日至 23 日在长沙为全省生态和环境局 140 名官员举办培训班（22,390 美元）、用于制作在 2018 年臭氧日拍摄的业界遵守规定的视频（32,073 美元，剩余合同价值 80,080 美元）和用于 2018 年为所有行业进行的财务审计（8,649 美元）。剩下的未分配余额**将由中国国际环境合作中心为地方生态和环境局购买仪器进行消耗臭氧层物质监测，以建立其能力并实现可持续淘汰氟氯化碳的规定。**在最后编定本文件时，秘书处并不清楚剩下的未分配余额的确切数值。**

<u>哈龙行业</u>

104. 在上次进度报告与 2018 年 8 月 31 日之间共发放了 1,237,015 美元，**截至 2019 年 2 月 28 日又发放了 438,368 美元**。2014 年，中国国际环境合作中心制定了开发国家哈龙回收和管理系统的计划（NHRMC），哈龙行业的剩余资金完全被指定用来支持这个计划。2015 年至 2016 年，国际环境合作中心与公安部内的消防产品认证中心合作建立了国家哈龙回收和管理系统（NHRMC）。2017 年，国家哈龙回收和管理系统在上海宣传哈龙回收，并与政府和私营部门合作鼓励哈龙回收利用。根据过去三年取得的经验和收到的反馈意见，2018 年，国家哈龙回收和管理系统与国际环境合作中心重新设计了工作计划，启动了一个开发信息管理系统的项目，并从天津和江苏回收了 1.5 吨哈龙-1301。剩余资金中的一部分将为监测站、回收中心和地方消防局购买设备，用于分析哈龙产品的成分及确定回收过程中的哈龙纯度。

105. **2018 年，上海雷诺安全技术有限公司还从出售的废船中回收了 450 千克哈龙-1301。由于回收的哈龙-1301 的市场价格不足以支付回收成本，雷诺公司向国家哈龙回收和管理系统申请补偿性补贴，目前国家哈龙回收和管理系统正在对此进行评估。2019 年 1 月，雷诺公司正式获得国家哈龙-1301 回收站的认证，并将获得援助以提高其产能。**

106. 国际环境合作中心目前正在选择合格的企业来建立哈龙-1211 回收中心。该项目预计于 2019 年开始，并于 2020 年完成。与此同时，国际环境合作中心将为浙江东阳化工有限公司提供援助，以确保其安全储存 2,261.4 吨的哈龙-1211。**2018 年 12 月，国际环境合作中心和国家哈龙回收和管理系统批准了一个 145 万美元的项目，用于建立新的储罐和气瓶以及设立储存管理和监测系统。目前，国际环境合作中心和国家哈龙回收和管理系统正在设法解决地方政府提出的安全问题，该项目预计将很快重启。** 国际环境合作中心和国家哈龙回收和管理系统计划在 2019 年组织进行哈龙回收的政策和法规的研究。

107. **国际环境合作中心和国家哈龙回收和管理系统将与上海消防部门签订一份价值 20 万美元的合同，以调查上海地区的哈龙数量和分布情况。调查其他省份哈龙数量的工作目前正在筹备之中。**

[36] **这个数值与表 1 报告的 29,465 美元不同。在最后编定本文件时，出现这一差异的理由尚不清楚。**

108. 国家哈龙回收和管理系统和国际环境合作中心致力于探讨国际合作回收和处置哈龙的可行性，以协助其他第 5 条国家实现履约目标。未来几十年中，氢氟碳化合物消防产品有可能成为哈龙产品的主要替代品。考虑到《基加利修正案》将逐步减少氢氟碳化合物的生产和消费，从建立国家哈龙回收和管理系统获得的相关经验可适用于氢氟碳化合物的再循环、再利用、回收和处置。

109. **利用到目前为止发放的资金，中国政府已逐步建立并运行了国家哈龙回收和管理系统。在 1,002 万美元结余中，238 万美元用于正在进行的活动。尚未支用的 764 万美元将用于旨在进一步改善回收系统和实现可持续哈龙管理的活动，包括：哈龙-1211 回收中心的建立和运营、哈龙-1301 回收业务、哈龙回收站的能力建设、哈龙检测仪器的采购、回收哈龙的政策和法规研究、调查中国关键地区的哈龙数量和处置无法使用的哈龙和残留物。这些活动将在 2019 年至 2022 年间执行。**

第二类加工剂

110. 在**第八十次会议**和 2018 年 8 月 31 日之间共发放了 190,050 美元。**自那时以来，共又发放了 3,554,577 美元。**与四氯化碳和其他消耗臭氧层物质生产者合作的六个**生态和环境局**获得设立消耗臭氧层物质管理办公室、建立企业报告消耗臭氧层物质数据的专门渠道以及进行企业现场视察的援助。该项目已经完成，**最后一笔资金已于 2019 年 1 月发放，为此项活动发放的总金额为 280,000 美元。建议将剩余的 8,357 美元结余用于加强消耗臭氧层物质的监测和管理。**

111. 正在实施四氯化碳残留物处置项目，以支持四氯化碳副产品生产商处置其四氯化碳精炼和转化设施产生的蒸馏残留物。与 9 家企业签署了总值 460 万美元的合同，用于建造焚烧炉（3）、提升现有焚烧炉（2）、建造减少残留物的装置（2）和补贴运营费（2）。**已完成三个焚烧炉和两个减少残留物装置的建造，并已对焚烧炉和装置进行测试；一家企业已完成对现有焚烧炉的升级，但另一家企业尚未完成升级。对运行焚烧炉接受补贴的两个企业进行现场核查的结果证实它们使用焚烧炉处置了四氯化碳残留物。为这些活动发放的资金为 3,228,084 美元，到 2019 年 12 月仍将为完成的活动发放 1,371,915 美元。建议将剩下的结余 845,970 美元用于加强消耗臭氧层物质的监测和管理。**

112. 根据执行委员会第 75/18 号决定的要求，2018 年 3 月已启动对中国四氯化碳的生产及其应用于原料的研究。已经设计了用于甲烷氯化物生产企业（四氯化碳副产品生产商）和四氯化碳原料应用企业的调查问卷并已在 7 月分发。正在对企业进行实地调查并正在编写一份评估目前四氯化碳生产和原料应用产生的排放的报告。**该报告的中文版已于 2019 年 4 月 23 日提交；秘书处未能及时审查这份报告以便将其列入本文件。**

113. 第 XXIII/6 号决定规定，在 2014 年 12 月 31 日之后，只有在必要用途的豁免下才允许使用四氯化碳测试水中含油量。2017 年，中国政府宣布它将在 2019 年之前停止在实验室使用四氯化碳测试水中含油量。2018 年 1 月，国际环境合作中心与天津生态环境监测中心签订合同，制定替代测试标准。现已确定使用正己烷取代四氯化碳的技术方法，并制定了三项国家标准，它们已被公布**并在 2019 年 1 月 1 日起生效，并为合同的最后一笔付款发放了 10,978 美元。2018 年 8 月与北京国化精试咨询有限公司签订了合同，继续进行替代技术的培训和推广，以取代实验室中使用消耗臭氧层物质进行分析；合同价值 110,224**

美元，已经发放第一笔付款 **10,978** 美元。另外还为项目评价、验收和现场核查提供技术支持的专家发放了 **14,125** 美元。

114. 此外，还启动了两个项目，以便为可持续履行《蒙特利尔议定书》加强能力建设。一个项目是设计和建造消耗臭氧层物质在线数据报告信息系统（第二阶段）（**250,000** 美元）。在线系统通过整合所有消耗臭氧层物质的数据，为氟氯烃生产淘汰管理计划第一阶段建立的氟氯烃在线管理信息系统作出补充，它将成为生态与环境部和地方生态和环境局监测其管辖范围内的企业的管理平台。另一个项目是监督和管理消耗臭氧层物质领域的海关能力建设（**750,000** 美元）。在海关管理局进行机构改革的情况下，国际环境合作中心正与海关管理局的新部门进行协调，以便监督和管理消耗臭氧层物质的贸易。

115. 鉴于未发放的结余约有 **124** 万美元，中国政府建议开展以下活动，以加强对消耗臭氧层物质的长期监测和管理：

(a) 建立和提升关于四氯化碳生产的在线监测系统。该系统重点关注所有氯甲烷生产商的四氯化碳生产、转换、销售和储存，它将补充消耗臭氧层物质管理信息系统；

(b) 调查四氯化碳生产和原料用途。这项活动将补充根据第 **75/18** 号决定提交的研究报告，该研究由一名专家进行，重点是四氯化碳生产和原料用途期间的四氯化碳排放量。计划该活动作为对四氯化碳生产和原料用途的实地调查和核查。四氯乙烯工厂未包括在内。

(c) 支持企业开发和供应经修订的国家标准规定使用的必要试剂（四氯化碳替代物）。新标准发布后，替代品四氯乙烯的供应无法满足市场需求。这项活动将支持试剂制造商建立净化四氯化碳的必要设施，以满足新标准的规定和市场需求；

(d) 提供地方生态和环境局关于消耗臭氧层物质的监督和执法的培训和能力建设。这项活动旨在定期向地方生态和环境局进行关于消耗臭氧层物质的管理、查验、监督和执法的培训课程。将对从事环境监督的省、市、县级生态和环境局的人员进行培训；

(e) 关于消耗臭氧层物质销售的市场监督和信息收集。将与一家咨询公司签订合同，以收集消耗臭氧层物质的销售和市场信息并查明可疑的非法销售情况。与此类销售相关的信息将报告给生态与环境部，以便采取进一步行动；和

(f) 关于消耗臭氧层物质的管理、查验、监督、执法以及消耗臭氧层物质的处置等方面的技术、政策和法律支持。将雇用个别专家向相关机构提供此类支助。

聚氨酯泡沫塑料

116. 从上次进度报告至 2018 年 8 月 31 日之间总共发放了 506,548 美元，**到 2019 年 2 月 28 日还发放了 1,358,419 美元。剩下的余额 296,979 美元将用于采购即时发泡剂探测器和在 2019 年 3 月举办实施蒙特利尔议定书能力建设国际研讨会。**在聚氨酯泡沫塑料行业进行的 10 项研究活动已在 2018 年上半年完成。选择进行这些活动是为了支持以低价开发供中小型企业（SME）使用的零消耗臭氧潜能值和低全球升温潜能值的发泡剂配方以及为优化泡沫塑料产品的稳定性、性能和绝缘性开发预混多元醇系统的配方。

117. 2018 年 6 月，河北省一个建筑工地使用氢氟烯烃为发泡剂完成喷雾现场试验。现场试验对 2,350 平方米的住房建筑进行了喷洒。对泡沫塑料在冬季低环境温度下的尺寸稳定性、隔热性和其他相关性能进行了评估，**报告正在最终编写之中。**

118. 2014 年 12 月，国际环境合作中心与四个配方厂家签订了合同，它们通过安装生产设施和实验室设备，以及通过试验和测试新配方，建立了水吹预混多元醇的生产能力。目前，配方厂家正在为下游泡沫塑料企业提供技术服务，并已向包括中小企业在内的下游用户出售了 2,000 多吨预混多元醇替代物。这四个项目于 2018 年 6 月完成，**配方厂家在 2019 年初收到最后一笔付款。**

119. **国际环境合作中心**还与 11 个省/市的**生态和环境局**签订了合同，以期提高公众对保护臭氧层的认识、加强可持续履约能力并确保 2010 年后不再有氟氯化碳或其他受控的消耗臭氧层物质再被使用。截至报告日期，11 个地方生态和环境局都已按照合同要求实现了目标和条件。这些项目加强了这 11 个地区的知识、管理和执法能力，提高了对国家消耗臭氧层物质管理条例的认识。 11 个生态和环境局在 2018 年 12 月**完成了这些项目，并收到了它们合同的最终付款。**

120. 政府颁布了《消耗臭氧层物质管理条例》和《关于管理建造生产或使用消耗臭氧层物质的设施的通知》，并采取了其他政策行动，禁止再用已经淘汰的氟氯化碳和落实对氟氯烃的管制。不过，泡沫塑料行业中有许多具有各种应用的企业。因此，国际环境合作中心通过与大多数配方厂家和泡沫塑料企业所在的五个省份（即河北、河南、山东、四川和天津）的合同继续开展监测活动，访问化学品经销商、配方厂家和泡沫塑料企业，以便收集发泡剂、预混多元醇配方和最终泡沫产品的样品。访问了 420 多家泡沫塑料企业和配方厂家，收集了 780 多个泡沫塑料和原料样品。对这些样品进行初步测试后，怀疑其中少数样品可能含有已被淘汰的氟氯化碳/氟氯烃。**发现山东有三家企业非法使用 CFC-11，它们已依照《消耗臭氧层物质管理条例》受到处罚。**

121. 政府认为监测活动已有效落实了既定的政策制度。但是，次级行业和配方厂家的数量、检验人员对泡沫塑料生产的了解不足以及发泡剂检测器数量的不足（并非所有县城都有监测器）都会降低对泡沫塑料行业进行检验和监测的效率。此外，《消耗臭氧层物质管理条例》不够详尽，没有为处理可能出现的每种具体情况提供详细规定，而必须依靠省的政策和生态和环境局的解释作出判断。此外，替代技术尚未深入这个行业，并且较高的成本也使中小企业不愿意改用零消耗臭氧潜能值和低全球升温潜能值的替代品。国际环境合作中心和生态与环境部完全了解这些挑战，它们将继续通过不同渠道为地方生态和环境局及环境监测局提供技术支助。

122. **采购了 14 个即时发泡剂探测器并分配给了 5 个生态和环境局，以继续监测泡沫塑料行业淘汰氟氯化碳的状况。根据在提高检验效率中取得的积极成果，拨出 20 万美元增购 10 个探测器，以加强缺乏测试设备的主要省份的监测和执法能力。**

123. **为了提高测试能力和加强执法（只有三个机构能提供经认证的测试报告），中国政府将增设六个测试中心，它们采用测试泡沫塑料中发泡剂的技术标准并将在 2019 年底以前成为得到认证的聚氨酯泡沫塑料发泡剂测试实验室。**

124. **中国政府还于 2019 年 3 月 18 日举办了中国执行蒙特利尔议定书能力建设国际研讨会，有 10 多个第 5 条缔约方和非第 5 条缔约方、臭氧秘书处、基金秘书处、科学评估小组和所有执行机构参加。近 100,000 美元的结余用于举办这次研讨会、支付 2018 年 8 月以来测试泡沫塑料和多元醇样品的费用以及提高测试能力。**

<u>氟氯化碳制冷维修行业</u>

125. 在上次进度报告至 2018 年 8 月 31 日之间发放了总额 550,473 美元，**到 2019 年 2 月 28 日又发放了 331,716 美元。**国际环境合作中心在 13 个城市为维修技术人员开办职业培训课程所设的 13 个培训中心都已完成它们的项目。截至 2018 年 8 月，已培训 4,100 多名技术人员、培训人员和学生（其中三个培训中心已完成培训方案）。2017 年至 2018 年，国际环境合作中心进行了实地视察并发表了所有 13 个培训项目的最后报告。

126. 到 2018 年底，又有 500 名技术人员在 2017 年签约的两个培训中心接受培训。2018 年，国际环境合作中心还与四个培训中心签约，进行有关良好制冷做法的培训，**这个培训将在 2019 年年中完成；**完成了关于在 R-290 空调系统运行和维护过程中控制制冷剂泄漏的研究以及拆船行业和超市冷链的两项调查。**来自拆船行业的 150 名技术人员和管理人员接受了关于消耗臭氧层物质管理政策和通过回收减少消耗臭氧层物质排放的培训。**

127. 国际环境合作中心将进行监测和管理活动（包括咨询、培训、评价和核查），实现持续淘汰氟氯化碳的规定。**培训活动的结余 15,924 美元用于监测采购消耗臭氧层物质的即时探测器，以支持生态和环境局进行现场视察的工作。**

<u>溶剂行业</u>

128. 在上次进度报告至 2018 年 8 月 31 日之间共发放了 773,756 美元，**截至 2019 年 2 月 28 日又发放了 656,219 美元**。截至 2018 年 8 月 31 日，来自 10 个海关办事处的 3,800 名海关官员都接受了关于消耗臭氧层物质的培训，并且查验消耗臭氧层物质是其日常工作的一部分的每位海关官员都收到了测试设备。截至 2018 年 6 月 30 日，已有 5,000 多名地方生态和环境局的官员接受了与消耗臭氧层物质有关的政策的培训，并有 18,000 多人参加了宣传活动。各地方生态和环境局组织了 30 多次对使用消耗臭氧层物质的企业的现场视察。**所有得到协助的 31 个生态和环境局都编写了完成报告**，并在 2018 年底收到最终付款。

129. **国际环境合作中心**在北京大学的支持下，完成了题为“分析中国批准基加利修正案对氢氟碳化合物的管理的影响”的报告。完成了五个机构[37]的替代技术和硅油优化的研究。继续落实管理和监测活动，包括现场核查、监测审计和项目评价。

130. **正在制定与消耗臭氧层物质相关文件的电子管理系统，一旦这个系统得到国际环境合作中心验收，将发放最后一笔资金 92,307 美元。不久将发放结余 2,987 美元，用于支持中国管理消耗臭氧层物质的国际研讨会。453,119 美元结余已用于采购消耗臭氧层物质即时检测设备，以支持关键生态和环境局。**

131. **根据第 73/20 号决定，开发计划署修订了 2012 年提交的综合项目完成情况报告，以反映过去四年在溶剂行业实施的活动。在剩下的结余发放后，将提交综合项目完成情况最后报告。**

**应计利息**

132. 表 2 载列收到的利息。

**表 2. 中国各行业计划报告的利息（美元）**

| 行业 | 2017 年 7 月 1 日至 2018 年 6 月 30 日 | 2010 年 1 月 1 日至 2018 年 6 月 30 日 |
|---|---|---|
| 氟氯化碳生产、哈龙、第二类加工剂和聚氨酯泡沫塑料 | 2,837 | 21,109 |
| 制冷维修 | 5,574 | 93,565 |
| 溶剂 | 11,364 | 325,636 |
| **共计** | **19,775** | **440,310** |

133. 与过去的报告一样，溶剂行业的应计利息明显高于其他行业的应计利息，因为人民币账户的利息高于美元账户的利息。**2018 年 7 月 1 日至 2019 年 6 月 30 日期间的累计利息将在该期间的财务审计中计算。**

**秘书处的评论**

总体进展

134. 在第八十次会议上，各执行机构再次保证与每一行业计划相关的资金结余都将在 2018 年底以前完全发放，项目完成报告将提交 2019 年执行委员会第一次会议。随后，执行委员会除其他事项外，赞赏地注意到中国政府已确认将在 2018 年底前完成与所有部门计划相关的活动、相关的研究和技术援助报告将提交给 2018 年最后一次会议以及项目完成报告将提交给 2019 年执行委员会第一次会议（第 80/27（c）号决定）。

135. 此外，在第八十次会议期间，委员会就归还余额的问题进行了非正式讨论，在报告这些讨论的结果时，一名成员在另一名成员的支持下指出，虽然要求将未结清的余额归还基金的要求已经撤回，但他认为以及其他成员也认为，未结清的余额原则上应归还基金或

[37] 北京宇极、东阳巍华、上海矽利康、衢州三成和华夏神州。

冲抵未来的核准款，并且委员会未来举行的会议应再次审议归还余额的问题（UNEP/OzL.Pro/ExCom/80/59）。

136. 提交第八十二次会议的进度报告表明，在 2018 年底完成所有活动的承诺没有在若干行业计划中得到兑现，此外，还提议将一些行业计划延长至 2020 年（第二类加工剂）和到 2022 年（哈龙）。还有人指出，计划完成日期为 2018 年 12 月的所有其他行业计划（氟氯化碳生产、聚氨酯泡沫塑料、维修、溶剂）都有计划在 2019 年发放的余额。在 2,589 万美元余额中，截至 2017 年 6 月 30 日，仅发放了 413 万美元（16%）。**第八十二次会议**的余额 2,224 万美元仍然只占 2009 年 12 月 31 日的余额 5,200 万美元的 43%。

137. 中国政府注意到上述各点，强调没有关于归还资金的任何具体决定或要求，并进一步指出，剩下的资金是实现永久和可持续淘汰这项总体目标所必需的，并已就此作出安排。此外，中国政府指出：

(a) 氟氯化碳生产、聚氨酯泡沫塑料、制冷维修和溶剂行业的所有实质性活动都将在 2018 年 12 月以前按计划完成，并将在 2018 年 12 月顺利完成活动后在 2019 年发放最后款项；

(b) 没有按期完成哈龙行业的活动的主要原因是国际环境合作中心从 2014 年到 2018 年的工作重点是建立基础和逐步建立国家哈龙回收和管理系统。国际环境合作中心总结了从哈龙库（2008 年-2013 年）示范项目汲取的经验教训并制定了在 2014 年设立哈龙回收系统的战略计划。经过四年的努力，国家哈龙回收和管理系统已经建立并正在运行；

(c) 有三个主要原因以致没有完成第二类加工剂行业计划。第一，由于四氯化碳残留物的处置在中国也受危险废物管理系统的管理，因此，国际环境合作中心在启动项目前，首先必需完成可行性分析，包括与专家一起访问四氯化碳副产品生产商和视察危险废物处置中心以及与主要省级生态和环境局进行多轮讨论。其次，建设各个地方生态和环境局的能力是一个长期项目，根据该项目，地方生态和环境局需要开展大量活动并满足相关指标。最后，四氯化碳作为氯甲烷工厂的副产品将继续产生，并预计未来它将继续作为原料使用。因此，始终需要长期监测四氯化碳的生产和使用。所以，生态与环境部有必要改进和完善法规。

对提交第八十三次会议的最新报告表明的总体进展提出的补充意见

**（第 138 段至第 148 段都是新的内容。不过，为方便阅读，取消了粗体字）**

行业计划的完成日期

138. 在第八十二次会议上，中国政府表示，氟氯化碳生产、聚氨酯泡沫塑料、制冷维修和溶剂行业的所有实质性活动都将在 2018 年 12 月按计划完成，并将在 2018 年 12 月顺利完成活动后，在 2019 年发放最后款项；而第二类加工剂和哈龙行业计划的完成日期分别为 2020 年 12 月和 2022 年 12 月。但是，执行委员会没有对此事项作出决定，并决定推迟

到第八十三次会议审议财务审计报告（第 82/17 号决定）。最新报告表明，在 2018 年 12 月没有完成任何行业计划，因为它们都有在 2019 年需要进行的活动或计划进行的活动。

139. 秘书处注意到，执行委员会未就项目延长到 2018 年 12 月以后之事作出决定，因此，认为在 2019 年不应进行任何活动。中国政府认为，从委员会的角度来看，无法断定不应在 2019 年进行任何其他活动的评估是否正确。

140. 中国政府提议的行业计划完成日期分别如下：氟氯化碳生产、聚氨酯泡沫塑料、制冷维修和溶剂行业 2019 年 6 月、第二类加工剂行业 2020 年 12 月和哈龙行业 2022 年 12 月。

在共同活动中使用来自若干行业的资金

141. 有人还指出，目前正在将若干行业的部分余额分配给与计划的总体监测有关的共同领域（例如，采购消耗臭氧层物质识别器、协助海关、监测研讨会、对所有行业的技术审计改为对氟氯化碳生产一个行业的费用）。中国政府指出，在委员会和秘书处发出强烈信号，认为应将余额从用于个别行业计划中的狭隘重点改为用于确保可持续淘汰消耗臭氧层物质而特别是可持续淘汰 CFC-11 的监测活动，一些余额就是照此分配给这类活动的。

142. 关于建设生态和环境局的能力，这方面的工作都出现在若干行业计划并且实际上都已完成，中国政府总结了多年来提供的援助和取得的成果。过去五年，共有 31 个生态和环境局参加了消耗臭氧层物质的能力建设项目，分别得到聚氨酯泡沫塑料行业计划（11 个生态和环境局，2,900,000 美元）、第二类加工剂行业计划（6 个生态和环境局，2,800,000 美元）和溶剂行业计划（14 个生态和环境局，3,880,000 美元）的支助。[38]

143. 依照国际环境合作中心提供的信息简述实施的活动如下：

(a) 在地方政府一级建立保护臭氧层的合规协调机制；酌情进行消耗臭氧层物质的生产和消费、消耗臭氧层物质的销售以及进出口数量的数据调查；查明辖区内使用消耗臭氧层物质的企业；

(b) 通过地方一级核准的环境影响评估严格控制新的建筑项目，以确保除原料用途外，中国不再批准建造任何新的消耗臭氧层物质生产和消费设施；

(c) 针对城市或县级官员和企业举办关于消耗臭氧层物质的管理和履约的培训班。超过 35,000 名地方生态和环境局及其他相关部门的官员以及超过 13,000 名企业管理人员接受了培训。通过互联网、电视、学校或社区组织了全国范围关于保护臭氧层的宣传活动；和

(d) 根据通过报告平台和其他来源、部委和地方生态和环境局收到的信息，共同采取行动打击消耗臭氧层物质的非法行为。

[38] 向秘书处提供了列表，载列了与每一个生态和环境局签订的合同的价值。

144. 此外，利用氟氯化碳生产行业提供的资金，2019 年 1 月 21 日至 23 日在湖南省长沙市为来自各省的 140 名官员举办了一期培训班，分享关于管理消耗臭氧层物质的经验教训。

145. 关于存在于若干行业计划中向生态和环境局提供消耗臭氧层物质即时探测器以加强它们监测和执法能力的计划，中国政府也作了总结。用于此目的的资金总额约为 768,479 美元，来自以下来源：氟氯化碳生产计划（99,436 美元）、聚氨酯泡沫塑料行业计划（200,000 美元）、溶剂行业计划（453,119 美元）和维修行业（15,924 美元）。为了有效利用资金，生态与环境部计划将这四个行业的余额结合起来，为地方生态和环境局购买相同类型的探测器。 生态与环境部计划通过集中采购的方式尽可能多地购买探测器。它将涵盖所有省级生态和环境局，特别是在主要聚氨酯泡沫消费区将配备更多的探测器。

146. 中国政府还指出，即时探测器有手提箱大小，能测试泡沫塑料产品、发泡剂以及预混多元醇的成分。在测试中，收集的样品通过进料口放入探测器。然后，探测器通过气相色谱法对样品所含的化学物质生成测试谱图。根据化学物质不同的峰值时间，可以初步筛选出发泡剂的组成成分。一个样品的整个测试过程通常需要大约 20 分钟。每个探测器的成本是 20,000 美元，它们都是本地生产的。

147. 秘书处支持利用这些剩下的余额为生态和环境局购买消耗臭氧层物质即时探测器的做法，但有一项谅解，即中国政府将继续在未来的财务审计报告中报告地方生态和环境局作出的监测努力，包括报告查获的使用 CFC-11 的情况。秘书处建议，一旦列入财务审计报告的项目的所有剩余余额都已发放并且这些项目都已完成，中国政府应继续根据氟氯烃淘汰管理计划聚氨酯泡沫塑料行业的年度进度报告提供这项报告。

剩余的余额和建议的活动摘要

148. 总之，根据中国政府提供的资料，在 1,549 万美元的资金结余中，已经为正在进行的活动发放了 560 万美元，其中 768,479 美元用于为生态和环境局购买作为监测活动一部分的消耗臭氧层物质即时探测器。在尚未发放的资金中，764 万美元属于哈龙行业计划，将用于旨在进一步改善回收系统和实现哈龙可持续管理的活动（如上文哈龙部分所述），225 万美元属于第二类加工剂行业计划，其中 100 万美元将用于在线消耗臭氧层物质管理系统和海关培训和 124 万美元将用于六项活动，以加强消耗臭氧层物质的可持续长期监测（如上文第二类加工剂部分所述），秘书处对这些监测活动的评论如下。

监测淘汰的可持续性

149. 每个行业计划为秘书处认为有助于长期、可持续监测淘汰的活动分配了资金，包括监督和管理、与信息管理有关的活动、生态和环境局的能力建设和其他活动。在第八十二次会议上，秘书处要求中国政府提供更多信息，说明所开展的活动如何有助于可持续地长期监测淘汰。中国政府提供的信息和秘书处的评论如下。

四氯化碳生产行业和加工剂行业

150. 四氯化碳继续是氯甲烷工厂的副产品（以及甲基氯、二氯甲烷和氯仿），其中生成的四氯化碳比率尽可能降低。四氯化碳仍被一些化学品生产商作为原料使用，用于使用四

氯化碳排放控制的加工剂以及根据国家注册和配额制度作为蒙特利尔议定书缔约方允许的实验室用途。为了使四氯化碳的生产和消费限制在中国政府允许的范围内，生态与环境部/国际环境合作中心向相关企业发布了四氯化碳实验室用途和加工剂应用的消费量配额。每个四氯化碳原料用户都必须在生态与环境部/国际环境合作中心登记。允许合格的四氯化碳生产商向具有消费配额或登记的四氯化碳用户出售四氯化碳。合格生产者生产的任何过量四氯化碳都必须转化为二氯甲烷/全氯乙烯（MCl/PCE）或焚烧销毁。因此，需要继续监测四氯化碳的生产和使用、向生态与环境部/国际环境合作中心报告四氯化碳的生产/消费数据和地方生态和环境局定期进行检查。

151. 为了加强生态与环境部和地方生态和环境局对四氯化碳生产商的日常监测，计划重新启动和升级四氯化碳在线监测系统。将建立一个在线监测平台，生态与环境部和地方生态和环境局通过这个平台可从四氯化碳生产商得到实时数据。

152. 正如在执行淘汰四氯化碳生产计划期间所确定的那样，含四氯化碳的残留物是在生产四氯化碳时产生的。如果不加以焚烧销毁或委托焚烧销毁，四氯化碳可能会被收回并出售用于非法用途。为了降低这种风险，九个氯甲烷工厂的焚烧设施由国际环境合作中心提供经费，而由地方生态和环境局监测四氯化碳残留物的处置情况。

153. 2017 年，中国政府宣布承诺在 2019 年之前停止使用四氯化碳进行实验室水中含油量的测试。为了利用非消耗臭氧层物质萃取剂取代四氯化碳进行水中含油量的测试，生态与环境部已完成研究、测试和分析，通过这些努力已确定取代四氯化碳的方法并预计在不久的将来发布相关国家标准。鉴于替换四氯化碳并非仅是一个技术问题，生态与环境部将继续对替代技术进行相关培训和推广，并启动一个项目，鼓励企业提高替代试剂的质量，以取代实验室中的四氯化碳。

154. 政府还表示，它理解剩余的资金也可用于缔约方可能决定添加到《蒙特利尔议定书》控制的加工剂清单上的任何新加工剂。

155. 中国政府了解到这些挑战，认为有必要将该计划延长到 2018 年以后，并继续使用这些资金确保持续淘汰用于受控用途的四氯化碳。

156. 秘书处赞赏地注意到为该行业发放 1,200,000 美元用于长期监测和管理的提案。秘书处在支持为此目的发放资金的同时，注意到金额庞大，因此想更好地了解这些获得资助的活动与已经开展的活动有何关联。秘书处还要求说明四氯化碳生产商如何获得它们的资格；用户如何注册登记，以及此类注册是否仅限于已表明具有聚酰胺应用能力、作为原料使用或有实验室用途的使用者；国际环境合作中心是否和如何设定四氯化碳的配额；与在线监测系统有关的其他信息，包括预计它何时运行的信息；以及是否要求所有氯甲烷工厂都需拥有并运行处置四氯化碳残留物的焚烧炉。

157. 中国政府指出，有 15 家氯甲烷生产商生产四氯化碳和其他各种氯甲烷。 15 家氯甲烷生产商中只有 3 家被允许依照国际环境合作中心为原料、实验室和加工剂用途设定的配额向已经登记的用户出售四氯化碳。只有在 2007 年以前就拥有生产配额的四氯化碳生产商才能出售四氯化碳。生态与环境部/国际环境合作中心每年审查它们的资格。

158. 总共有 8 家企业提供用于实验室和作为加工剂使用的四氯化碳，它们需要向生态与环境部申请年度采购配额。2017 年，生态与环境部向这 8 家企业发放了 395 公吨的配额。对于原料用户，生态与环境部每年对注册进行管理。申请注册的四氯化碳原料用户必须提交必要的批准文件，包括环境影响评估（EIA）报告。 国际环境合作中心在审核了提交的文件后，在其网站公布注册结果，确认原料的用途和四氯化碳的数量不能超过环境影响评估报告中原料设施的核准的能力。登记具体规定了使用四氯化碳生产的产品类型和四氯化碳的数量。

159. 在中国，四氯化碳残留物的处置必须符合危险废物管理条例，这是有别于消耗臭氧层物质管理条例的另一个管理制度。根据现行政策，氯甲烷生产商可以选择通过地方生态和环境局批准的符合环境影响评估的自用处置设施处置四氯化碳残留物，或将残留物送至合格的危险废物处置中心。生产商需要向地方生态和环境局报告产生、处置和储存的残留量。此外，自设的处置设施由地方生态和环境局加以监督，以确保其符合国家排放标准和批准的环境影响评估规定。**国际环境合作中心进一步指出，三家氯甲烷生产商是生产 HCFC-22 公司集团的一部分；不过，这些氯甲烷工厂不是 HCFC-22 生产公司的一部分，而是公司集团内的独立实体。因此，用于销毁副产品 HFC-23 的焚烧炉与用于销毁四氯化碳的焚烧炉不同；销毁副产品 HFC-23 所提供的补贴也与销毁四氯化碳所提供的补贴同样不同。**

160. 地方生态和环境局检查其管辖区域内的所有四氯化碳生产商和注册用户。根据现行法规，对检查频率没有强制要求，但实际上至少每年一次。地方生态和环境局检查就地储存四氯化碳的经销商。在资金用尽和项目完成后，仍将继续定期检查四氯化碳生产商和原料用户。

161. 由于技术问题，四氯化碳在线监测系统在 2015 年关闭。该系统仅涵盖四氯化碳行业计划下的氯甲烷生产商，但不包括新增的氯甲烷生产商，因此，生态与环境部/国际环境合作中心一直都在努力寻找将四氯化碳在线监测系统扩展到所有氯甲烷生产商的方法。

162. 执行委员会已邀请中国政府就其四氯化碳的生产及其用于原料的应用进行一项研究，并在 2018 年底之前向执行委员会提供研究结果（第 75/18（ b）（三）号决定）。**秘书处于 2019 年 4 月 23 日收到该报告的中文本。国际环境合作中心正在翻译该报告。执行委员会不妨请秘书处根据该报告为第八十五次会议编写一份文件。**

163. **计划将剩下的余额用于消耗臭氧层物质在线管理系统（250,000 美元）、海关管理局的能力建设（750,000 美元）以及加强消耗臭氧层物质长期、可持续监测的六项活动（124 万美元）。秘书处注意到以下情况：**

(a) **消耗臭氧层物质在线管理系统将使所有使用消耗臭氧层物质的企业能够申请并注册为消耗臭氧层物质用户，并报告数据。所以，秘书处原则上支持该项提案，但同时注意到，秘书处对目前的消耗臭氧层物质在线管理系统的细节不够熟悉，无法确定需要如何修改该系统，因此，也无法知道进行这项活动所需的合理资金。此外，来自其他项目的资金，包括氟氯烃淘汰管理计划下的甲基溴生产、工业用和商用制冷和室内空调行业计划以及氟氯烃生产淘汰管理计划也同样用于加强消耗臭氧层物质在线管理系统。这**

种合用资金的方式可能是对资源的有效利用，但却对监测财务和实施进展情况造成挑战；

(b) 甲基溴生产行业也为海关管理局的能力建设提出类似的供资。国际环境合作中心指出，甲基溴生产行业的合同侧重于检疫和装运前消毒处理的甲基溴，而第二类加工剂计划下的能力建设侧重于反走私工作。鉴于甲基吡咯烷酮生产行业签署合同的延迟，秘书处认为必须密切监测这项活动的进展情况，以确保在 **2020** 年 **12** 月之前完成；

(c) 虽然拟议的六项活动都很有用，但秘书处并不清楚将为每项活动分配多少资金。此外，秘书处认为，也应向执行委员会额外提交一些活动成果。例如，与市场监督有关的活动可以更好地了解生产 **CFC-11** 的设施如何能够购买四氯化碳。此外，市场监督活动似乎是一家咨询公司在该活动合同期间预备进行的活动。秘书处建议，在项目完成后，这种市场监督仍将继续有用，因此，生态与环境部应为此编列预算。设立和升级四氯化碳生产在线监测系统将使这种市场监督成为可能。秘书处建议中国政府通过世界银行向第八十五次会议额外提供有关拟议的活动、其预算和执行进度报告的信息。执行委员会还不妨就分配给消耗臭氧层物质在线管理系统和海关管理局能力建设的 **100** 万美元提供补充指导意见。

164. 正如本文件第一部分所载关于国家监测、报告和核查的文件所讨论的那样，秘书处强烈支持对四氯化碳加强监测的拟议措施，认为加强四氯化碳的监测对确保持续停止四氯化碳的使用和氟氯化碳的生产至关重要。根据中国政府提供的进一步资料，最近查获的氟氯化碳非法生产设施采用了共同生产途径，即在存在氯化锑的情况下将四氯化碳液相氟化和生成无水氟化氢；这些设施能购买四氯化碳作为原料，这表明应加强监测四氯化碳的机制。秘书处认为，拟议的措施对这方面有帮助。不过，秘书处不清楚为什么四氯乙烯工厂没有被纳入中国政府的四氯化碳监测工作。

淘汰氟氯化碳生产

165. **在第八十二次会议上，**中国政府指出，正如最近监测大气结果所示，似乎有一些氟氯化碳的生产和排放，特别是 CFC-11。由于作为氟氯化碳淘汰行业计划的一部分，所有已知氟氯化碳生产设施都拆除，并且国际环境合作中心已经视察了生产氟氯化碳的所有以前生产商，发现它们都没有重新启动氟氯化碳的生产，因此，任何氟氯化碳的生产都来自未经许可设立的非法生产设施。秘书处指出，根据氟氯化碳生产淘汰行业计划提交的核查报告附有证明关键设备已被销毁或使之无法使用的照片和视频。

166. 为了查明任何氟氯化碳的非法生产，将根据加工剂项目的规定，加强对四氯化碳生产的监测。此外，国际环境合作中心还建议在一些可能出现非法生产的省份扩大省级大气监测方案。

167. 生产氟氯化碳需要四氯化碳和无水氟化氢。注意到很难监测无水氟化氢的使用情况，因此，秘书处认为，加强监测四氯化碳的生产是防止今后非法生产氟氯化碳的关键步骤。同样，秘书处认为，扩大省级大气监测方案的提案对查缉未来非法氟氯化碳的生产至为有

用。秘书处询问目前省级大气监测方案是否已经包括观察氟氯化碳和四氯化碳的仪器以及如何扩大这个方案。**对中国政府提交的现行监测、报告、核查和执法系统的审查（第 82/65 号决定和第 82/71（a）号决定）提供了有关该国大气监测网络的更多信息及其扩大方案确保持续淘汰消耗臭氧层物质的计划。此外，该文件还强调了可用于加强监测生产消耗臭氧层物质以外其他化学品的设施的措施。**

聚氨酯泡沫塑料行业

168. 中国政府表示，虽然它认为 CFC-11 已被淘汰，但现在它知道有一些氟氯化碳可能被非法生产出来并用作聚氨酯泡沫塑料行业的发泡剂。为了核查使用何种发泡剂并确定聚氨酯泡沫塑料行业可能非法使用 CFC-11 的情况，地方生态和环境局的查验能力已经得到加强。但是，仍然需要加强对聚氨酯泡沫塑料制造商和泡沫塑料配方厂家的监控。因此，中国政府认为，需要在 2018 年以后继续实施监测方案，直至其资金完全用罄为止。

169. 此外，尽管对从 CFC-11 转化而来的泡沫塑料企业进行了广泛的持续监测，包括采集泡沫塑料样品用于分析其发泡剂的组成成分，但政府认识到，如果不对泡沫塑料以外的所有应用进行监测，那么在监测 CFC-11 方面仍可能存在漏洞。因此，中国政府和执行机构计划协调各行业之间的监测。

170. 秘书处强调，即使在聚氨酯泡沫塑料行业计划的资金用罄之后，仍需持续淘汰 CFC-11，并注意到已在五个省访问了 420 家泡沫塑料企业和配方厂家，收集了超过 780 个原料样品进行分析。关于怀疑含有氟氯化碳-氟氯烃的样品所占百分比很小，秘书处询问，合格的实验室进行的分析是否已确认使用了氟氯化碳，如果属实，则所占比例为何以及对使用氟氯化碳的企业可适用何种法规和条例。

171. 政府指出，样品含有氟氯化碳-氟氯烃的企业正在受到地方生态和环境局和公安部门（当地警察）的联合调查。预计结果将于 10 月底向公众发布。**最新的报告指出，查出山东省有三家企业非法使用 CFC-11，它们已按照规定受到处罚，此案已经结案。政府指出，这是省级监测活动的一部分。监测和评估报告中指出的 10 个案件是实施 2018 年特别活动的结果。**

172. 关于适用于使用禁用的消耗臭氧层物质的企业的相关规则和条例，政府表示，迄今已发现三家企业非法使用 CFC-11 并受到《消耗臭氧层物质管理条例》规定的处罚。

173. 秘书处指出，根据地方法规，承诺淘汰的企业使用 HCFC-141b 会受到执法措施。但是，在 CFC-11 的情况下，必须先确定它是否是存放备用的、来自先前使用的再循环气体（例如，冷却器）或在完全淘汰的截止日期之后生产的，这可能会根据《氟氯化碳生产协定》以及或许根据《氟氯化碳消费协定》的不遵守规定的情况受到处罚。这需要进一步分析。

溶剂行业

174. 对于溶剂行业计划，政府表示，为了进一步加强对溶剂行业淘汰进行可持续的长期监测，国际环境合作中心支持地方生态和环境局监测消耗臭氧层物质的活动并控制各自省内非法消耗臭氧层物质的生产和使用。此外，一些地方生态和环境局已建立了长期机制，为消耗臭氧层物质管理官员发布了消耗臭氧层物质的管理政策和成效评估规定。此外，通过支持开发溶剂行业的实施技术，已培训了若干专家为可持续的长期淘汰监测提供长期、有效的支持。秘书处指出，这些活动很有帮助，但目前仍不清楚这些行动特别是后者如何有助于确保对该行业进行可持续的长期监测。

维修行业

175. 政府指出，关于研究如何维修泄漏的技术援助项目和数据调查与氟氯烃淘汰管理计划的实施密切相关。在 R-290 制冷和空调维修和运行期间对制冷剂泄漏的研究是对替代品进行研究的一部分。在超市次级行业进行的数据调查与促进该次级行业的良好维修做法有关。秘书处指出，这些活动很有帮助，但与该行业得到可持续的长期监测无关。

哈龙行业

176. 哈龙行业的情况与其他行业有所不同，因为对 halon-1211 和 halon-1301 的需求没有替代品可以取代。这些应用该由通过回收和再循环得到的哈龙来满足，直到有替代品可用为止。哈龙回收计划是哈龙行业计划中的一个基本要素。中国哈龙行业计划还包括作为其中一项关键组成部分的哈龙库。据报，哈龙库部分的实施已经推迟。

177. 政府认为，非法生产 halon-1211 的风险非常低，因为在完全淘汰哈龙之前已储存了大量 halon-1211，而最低的年需求量只有 20 至 30 公吨。剩余的 halon-1211 都存放在一个前 halon-1211 生产商。中国政府建议将其全部或其中部分移动，以便将其存放在安全和可控的条件下，或者销毁/转换其中的一部分。中国政府认为，这对于避免 2,200 多公吨 halon-1211 的排放非常重要。

178. 相比之下，halon-1301 的生产仍仅供原料使用；这种新生产的 halon-1301 不添加到库存中，而专门用作原料。政府认为，halon-1301 受控用途的需求可由目前的库存满足，在没有替代品存在的情况下，可从拆除的消防装置回收和再生供各种应用使用的 halon-1301。现有灭火系统仍对 halon-1301 有所需求，出于安全的考虑，没有其他替代品可以取代，而对于民用航空，也没有任何其他替代品可用于某些飞机的灭火系统。民用航空正在全球范围内扩张，特别是在中国，预计未来五年到十年的年增长率将超过 10%。

179. 有两个与 halon-1301 相关的问题。首先，一个生产商仍在生产 halon-1301，[39]供作原料使用并出售给 8 个生产氟虫腈（一种农药）的生产商。因此，务使所有新生产的哈龙都出售给这 8 家企业，并且它们都需将其用作生产氟虫腈的原料，而不是出售供作他用。第二个挑战是在没有批准的替代品的情况下，如何向剩余的使用者而尤其是民用航空提供足够的 halon-1301。政府认为，为了避免为关键的用途进行生产，到目前为止，很明显只

[39] UNEP/OzL.Pro/ExCom/82/SGP/03 号文件指出，在生产 halon-1301 的过程中，HFC-23 作为原料使用。

有从市场回收 halon-1301 才能满足需求。因此，必须继续执行 halon-1301 回收方案，确保 halon-1301 的供应和避免非法生产的风险。

180. 秘书处同意哈龙回收计划是确保 halon-1301 得以持续供应的重要因素。但是，秘书处并不清楚，中国政府打算如何在项目完成后，继续对淘汰哈龙进行长期、可持续的监测。

特定次级行业的财务问题

181. 关于氟氯化碳生产行业计划，秘书处注意到，为制作一个关于消耗臭氧层物质的基本知识、《蒙特利尔议定书》的执行进展情况以及执法人员和消耗臭氧层物质经销商必要具备的执行技能的视频，签署了一个价值 112,153 美元的合同。在解释这项活动如何与氟氯化碳生产行业有关以及如何能加强对淘汰的可持续监测时，政府解释说，海关部门在进行消耗臭氧层物质的进出口管理培训时，将使用这一系列视频教科书，以期加强海关官员的监督能力并提高执勤官员的业务知识。它还对从事消耗臭氧层物质进出口的企业进行培训，使其遵守消耗臭氧层物质的管理规定，以便提高受到培训的人对消耗臭氧层物质的合规意识、管理技能和管理水平。

182. 关于第二类加工剂，2018 年 8 月，与 9 家企业签订了价值 460 万美元的合同，用于建造 3 个焚烧炉、改进 2 个现有焚烧炉、建造 2 个减少残留物的装置和补贴 2 笔运营费。鉴于企业将在 2018 年底之前收到合同价值 80％的首期款，秘书处要求说明企业为获得资金所需达到的指标，并询问这是否是一个追溯项目。政府解释说，这些都是要在 2019 年以前完成的投资项目（不追溯），支付首期款的指标是必须完成升级或建造处置设施。参与项目的企业必须承担建造或升级设施的大部分费用，国际环境合作中心仅提供一小部分资金以鼓励内部处置四氯化碳残留物。该项目旨在鼓励四氯化碳生产商在内部处置四氯化碳残留物，而不是将其送到其他处置中心，甚至出售再利用。秘书处指出，这种销售将被视为消费。

研究和技术援助报告

183. 关于这些余额提供的技术援助可能会对氟氯烃淘汰管理计划行业计划的实施、氟氯烃化工生产淘汰管理计划以及氟氯烃的淘汰产生何种影响，政府指出，对氟氯化碳、聚氨酯泡沫塑料和氟氯化碳生产行业必须提供技术援助，以确保随着市场的发展，使使用替代品的制造商和氟氯化碳替代品的生产商继续拥有最佳的技术选择。它的目的尤其是在防止那些已经选用消耗臭氧层物质替代品的企业在遇到其他替代品的挑战时，会违规使用氟氯烃化物。

184. 过去四年，溶剂行业计划支持进行研究和若干调研，包括研究和开发零消耗臭氧潜能值和低全球升温潜能值的替代品。溶剂企业在逐步淘汰的实施过程中，已选出两种新的替代品（碳氢化合物溶剂和无溶剂硅油）来代替 HCFC 141b，其他三种替代品正处于为更多应用准备相关合格认证的阶段。进行这项研究和这些调研的目的是为业界提供可持续的技术解决方案，并在它们遇到任何技术挑战时，尽量避免使用氟氯烃。

185. 聚氨酯泡沫塑料行业的进度报告包括已经完成的研究的相关摘要，主要是关于替代品的功能。考虑到这些研究是在多边基金援助下进行的，秘书处要求提供所有行业进行的

研究活动的完成报告，以便考虑如何传播这些研究结果。国际环境合作中心注意到秘书处要求提交相关报告，它表示将与各机构联系，以便确认其中是否存在无法披露的机密信息。**其中一些报告已经提交基金秘书处，而另一些报告正在最后定稿。**

**秘书处的建议**

186. 谨请执行委员会：

(a) 注意到：

(i) 赞赏地注意到 UNEP/OzL.Pro/ExCom/**83/11/Add.1** 号文件所载中国氟氯化碳生产、哈龙、聚氨酯泡沫塑料、第二类加工剂和制冷维修行业的财务审计报告及其最新报告；

(ii) 与每个行业计划相关的供资余额到 **2019 年 4 月**仍未完全发放；

(iii) 中国政府已经确认氟氯化碳生产、聚氨酯泡沫塑料、溶剂和维修行业计划都将在 **2019 年**完成，并将发放相关余额；

(b) **同意将第二类加工剂和哈龙行业计划分别延长至 2020 年和 2022 年；**

(c) 通过相关执行机构，要求中国政府：

**(i) 向 2020 年第一次会议提交截至 2019 年 12 月关于氟氯化碳生产、哈龙、第二类加工剂、聚氨酯泡沫塑料、溶剂和氟氯化碳制冷维修行业的财务审计报告，以及关于氟氯化碳生产、聚氨酯泡沫、溶剂和维修行业的项目完成报告；**

**(ii) 在 2020 年第一次会议将与氟氯化碳生产、聚氨酯泡沫塑料、溶剂和维修行业相关的任何供资余额归还多边基金；**

**(iii) 在今后的财务审计报告中，报告地方生态和环境局进行监测的结果，包括查得的 CFC-11 的情况，以及列入财务审计报告的各个项目的剩余余额都已发放并在这些项目都已完成后，根据氟氯烃淘汰管理计划的聚氨酯泡沫塑料行业的年度进度报告，继续提供此类报告；和**

(iv) 提交在所有行业进行的**其余**已完成的研究和技术援助报告，以便能够传播给其他第 5 条国家；

(d) **要求中国政府通过世界银行向第八十五次会议提交关于预备在第二类加工剂行业计划进行的活动、活动预算及其执行进度报告的信息；和**

(e) **要求世界银行尽快提交中国依照第 75/18 号决定提交的关于四氯化碳生产及其用于原料应用的研究报告的英文译文，以便将其提交第八十五次会议。**

## 第四部分： 淘汰甲基溴消费量的行业计划（工发组织）

中国：淘汰甲基溴国家计划的第二阶段 – 最后报告（工发组织）

187. 在第八十二次会议上，执行委员会审议了中国的甲基溴淘汰项目，要求中国政府和工发组织向第八十三次会议提交最后报告（第 82/18（c）号决定）。

188. 根据第 82/18（c）号决定，工发组织代表中国政府提交了甲基溴淘汰计划第二阶段的最后报告，该计划淘汰了 698.8 ODP 吨甲基溴，是烟草行业的剩余消费量和农业部门的总消费量。此前，该项目的第一阶段已淘汰商品行业和烟草行业的部分消费量 389 ODP 吨甲基溴。

189. 从 2015 年到 2018 年，中国为保护山东省的生姜申请了甲基溴的必要用途豁免（CUEs）。蒙特利尔议定书缔约方核准的必要用途豁免如下：2015 年 114 公吨（68.4 ODP 吨）、[40]2016 年 99.75 公吨（59.85 ODP 吨）、[41]2017 年 92.977 公吨（55.79 ODP 吨）[42]和 2018 年 87.24 公吨（52.34 ODP 吨）。[43]中国报告指出，2015 年至 2017 年根据《蒙特利尔议定书》第 7 条规定的甲基溴消费量低于核准的必要用途豁免量，2018 年甲基溴消费量在必要用途豁免量的范围内。[44]

190. 根据必要用途豁免淘汰甲基溴的工作计划包括以下内容：根据必要用途豁免管理甲基溴；优化土壤灭虫系统；建立可持续的绩效管理系统。

191. 山东省农业厅制定了必要用途的甲基溴消费法规，在此法规范围内，山东省农业环境保护和农村能源站制定了跟踪管理计划，确保甲基溴的消费量不超过这些年份的必要用途豁免量。每年编制一份关于甲基溴使用情况的年度监测报告，其中确认必要用途豁免量用于露天农田和受保护的生姜栽培以及土壤疾病发病率较高的地区。

192. 从 2016 年到 2018 年，该项目的重点是土壤消毒技术成果的综合示范和评估、技术标准的制定、土壤消毒技术的应用和推广以及技术交流。中国农业科学院植物保护研究所（IPP-CAAS）完成了对生姜、草莓、番茄和山药的土壤消毒技术评价。

193. 对于主要目标作物（即生姜、草莓和番茄），制定了土壤病原体的快速检测方法；开发了供小农使用的化学品土壤熏蒸的专门服务系统；开发了包括胶囊、注射喷雾、滴灌和农药喷雾在内的喷浇方法。对生姜和山药作物采用了替代技术，如氯化苦、棉隆、威百亩和二甲基二硫醚。对农业部门、技术人员和种植者提供了有关这些技术的培训，他们还进行了实地视察。 2016 年至 2018 年，对来自地方农业部门的 2,400 多名农民和 700 名参与者进行了有关作物病虫害鉴定、病虫害综合治理、土壤消毒技术和土壤熏蒸服务系统的培训。

[40]第 XXVI/6 号决定。
[41]第 XXVII/3 号决定。
[42]第 XXVIII/7 号决定。
[43]第 XXIX/6 号决定。
[44] 根据该项目的最后报告。

194. 能力建设包括征聘三名全职工作人员：一名项目官员、一名项目助理和一名新闻干事。此外，还征聘了土壤熏蒸登记、土壤熏蒸技术、政策制定和项目促进方面的顾问。

195. 出版了关于土壤灭虫技术的技术报告和项目手册；报道了关于项目成果的新闻和发布了关于土壤消毒的纪录片；举办了关于农业甲基溴淘汰技术和管理的讲习班。

196. 农业部宣布，农业部门从 2019 年 1 月 1 日起 禁用甲基溴。

财务报告

197. 为中国甲基溴淘汰项目核准的总额为 14,789,342 美元，其中包括第一阶段 7,185,958 美元和第二阶段 7,603,384 美元。在这笔总额中，已发放了 14,789,342 美元（100%）。

**秘书处的评论**

198. 秘书处指出，中国政府继续控制国内甲基溴的使用，因此，甲基溴的消费量都在必要用途豁免核准的数量范围内。还有人指出，由于从 2019 年 1 月 1 日开始在消费行业开始实施国家甲基溴淘汰计划，因此，除了检疫和装运前消毒处理外，禁止在农业部门使用甲基溴。

199. 执行委员会不妨注意到，除最终报告所述蒙特利尔议定书缔约方批准的必要用途豁免外，中国报告 2018 年甲基溴消费量为零。中国尚未根据《蒙特利尔议定书》第 7 条提交其消耗臭氧层物质消费量的数据。此外，中国没有申请 2019 年甲基溴的必要用途豁免量。

200. 政府已经承诺通过禁止在农业部门使用这种物质和不申请甲基溴的必要用途豁免的方式实现甲基溴的淘汰。

**秘书处的建议**

201. 谨请执行委员会：

(a) 注意到：

(i) 注意到 UNEP/OzL.Pro/ExCom/83/11/Add.1 号文件所载工发组织提交的中国淘汰甲基溴国家计划第二阶段执行情况的最后报告；

(ii) 除了蒙特利尔议定书缔约方批准的必要用途豁免量之外，2018 年中国没有报告甲基溴的消费量；

(b) 要求中国政府和工发组织：

(i) 在第 82/19（e）号决定要求进行的 2018 年甲基溴产量核查报告中列入甲基溴的消费量；和

(ii) 根据第 82/18（c）号决定，在第八十四次会议召开之前提交项目完成报告。

## 第五部分： 淘汰甲基溴生产的行业计划（工发组织）

202. 工发组织代表中国政府依照第 73/56(b)号决定向第八十二次会议提交了关于淘汰甲基溴生产行业计划执行情况的报告以及 2017 年生产和管制使用核查报告。在讨论之后，执行委员会除其他外，决定将甲基溴生产行业计划的完成日期延长至 2021 年 12 月 31 日，并要求中国政府通过工发组织向第八十三次会议提交关于开发管理信息系统（MIS）及其结合到海关管理局实施的监测和监督方案的合同的进度报告并更新工作计划，以确保在完成甲基溴生产的行业淘汰计划后继续长期监测甲基溴的工作计划，包括拟定显示履约、监测和执法的政策和体制安排（第 82/19(c)和(d)号决定）。

203. 工发组织代表中国政府向第八十三次会议提交了进度报告和最新工作计划。

与海关管理局签订的合同的进度报告

204. 由于国家质量监督检验检疫总局已纳入海关管理局，生态与环境部的国际环境合作中心与海关管理局正就新的备忘录展开谈判，确定在 2019 年至 2021 年开展的活动。一旦该备忘录最终确定，国际环境合作中心将签订一份开展这些活动的合同。

2019–2021 年执行计划

205. 工作计划包括 2019 年至 2021 年监测和监督甲基溴生产的近期活动以及旨在通过建立和实施有效的甲基溴监测和监督方案和工具确保长期履约的活动。

206. 关于前者，国际环境合作中心将开展三项次级活动：

(a) 通过改进数据收集表格并协助生产者每季度提交填好的表格的方式，加强对甲基溴生产者的数据收集；

(b) 通过持续监测甲基溴原料的使用情况并利用现有和历史数据评估和交叉核对数据的方式，加强对原料数据的收集和分析；和

(c) 征聘独立专家对 2019-2021 年甲基溴生产进行年度核查；对 2021 年后的独立核查尚未计划。

207. 鉴于项目完成后甲基溴生产仍将继续用于检疫和装运前消毒处理（QPS）用途，因此，将开展以下活动来确保长期监督和管理：

(a) 根据三个甲基溴生产商以及检疫和装运前消毒处理（QPS）的需求和原料用户的建议，实施甲基溴加附标签和追踪系统；

(b) 进行两次甲基溴原料用量调查（分别为 2017-2018 年和 2019 2020 年），以交叉检查生产数据和报告的原料用量，并开发甲基溴原料用途数据库。这些调查将集中在江苏、山东、上海和浙江省进行，这里都是将甲基溴密集作为原料使用之处。2021 年之后，消耗臭氧层物质管理信息系统将投入使用，甲基溴的原料用途将纳入消耗臭氧层物质管理信息系统，数据将定期更新。

目前，甲基溴原料用户必须在生态与环境部注册，并且甲基溴生产商只能向这些已经注册的用户出售甲基溴；不过，虽然国际环境合作中心定期对特定用户进行检查，但甲基溴原料用户目前并未向生态与环境部报告其甲基溴原料用量。一旦消耗臭氧层物质管理信息系统开始运行，甲基溴原料用户就将通过这个消耗臭氧层物质管理信息系统平台向生态与环境部提交消费量数据，而地方生态和环境局可访问消耗臭氧层物质管理信息系统，从而补充生态与环境部的监测和监督；

(c) 通过生态与环境部与海关管理局之间的合作，加强监督为检疫和装运前消毒处理进行的甲基溴生产、使用和管理机制。基于甲基溴附加标签和追踪系统，为检疫和装运前消毒处理生产的甲基溴将从生产到使用进行记录和跟踪，为现有的检疫处理监督系统提供信息，以便收集数据并进行统计分析；加强检疫和装运前消毒处理的熏蒸过程中对甲基溴浓度的现有监测，并向现有检疫处理监督系统提供数据（包括甲基溴浓度和剂量）；与甲基溴熏蒸企业建立协调机制，推动旨在减少检疫和装运前消毒处理中熏蒸甲基溴排放的规定做法；通过会议、培训和实地考察提高对甲基溴在检疫和装运前消毒处理中的使用的认识；更新出版物“动植物检疫处理原则和技术应用”，以反映最佳做法。参考资料将继续加以更新，以反映新的技术和建议，并且海关管理局将在项目完成后继续为海关官员和地方生态和环境局举办必要的培训；

(d) 为甲基溴利益攸关方开展关于甲基溴的生产、消费和淘汰的国家和国际政策培训和提高认识活动；为海关官员和地方生态和环境局的甲基溴利益攸关方举办培训班，以加强他们执行监测和管理职能的能力；和

(e) 建立一个由本国专家组成的专家小组，协助执行工作计划，包括协助监测和评估课税、制定或评估实施战略和计划、制定技术规格、对采购设备和服务进行技术评估并推荐有关甲基溴消费和生产行业的政策和法规。

208. 2019–2021 年工作计划的预算见表 3。

**表 3. 2019-2021 年中国甲基溴生产行业的预算（美元）**

| 活动 | 预算<br>(美元) |
|---|---|
| 对 2018-2021 年期间甲基溴生产商的核查 | 25,000 |
| 甲基溴原料使用的记录管理 | 8,000 |
| 甲基溴原料使用的调查（集中在江苏、山东、上海和浙江） | 90,000 |
| 甲基溴产品标签管理和追踪系统 | 120,000 |
| 监测和监督方案(海关管理局)<br>-记录检疫和装运前消毒处理的使用进行追踪<br>-更好地使用当前的监测工具<br>-改进检疫和装运前消毒处理的熏蒸和跟踪<br>-宣传活动<br>-更新目前的参考资料 | 350,000 |
| 2019-2021 年期间的数据收集和评估 | 12,000 |
| 为利益攸关方举办培训班和进行提高认识宣传 | 20,000 |
| 组成专家小组提供技术援助和咨询服务 | 7,104 |
| **共计** | **632,104** |

209. 鉴于在项目完成后将继续生产用于原料和进行检疫及装运前消毒处理用途的甲基溴，国际环境合作中心确认将在 2021 年 12 月 31 日之后继续开展以下活动：

(a) 甲基溴生产商将继续每季度向国际环境合作中心提交生产和销售数据，国际环境合作中心将继续审查这些数据和所需的支助文件，包括仓库日志、原材料日志、批量生产日志等；

(b) 国际环境合作中心将继续审查原料的应用情况，包括核实必要的支助文件，并将继续分析将甲基溴作为原料使用的企业的数据库和交叉查核信息，确保甲基溴不流入受控用途；[45]

(c) 甲基溴生产商将继续与每个甲基溴用户签订销售合同，其中具体指明销售的甲基溴的数量和用途。甲基溴生产商不能将甲基溴出售给个人；

(d) 甲基溴生产商只有在收到有关部门签发的检疫及装运前消毒处理用途的熏蒸许可证后，才可将甲基溴作为检疫及装运前消毒处理用途销售。对于必须进行检疫及装运前消毒处理的熏蒸货物的进出口，有关部门向进出口公司出具货物已按有关标准和规定熏蒸的证明。对于国内在检疫及装运前消毒处理方面的使用，熏蒸必须由国家或地方动植物或环境保护或卫生机构进行或授权，甲基溴生产者必须获得有关部门的认证以保证其目的；和

(e) 甲基溴生产商只能将甲基溴出售给符合资格的甲基溴原料用户，这些用户必需在相关政府部门注册或基于上述情况用于检疫及装运前消毒处理。

**秘书处的评论**

<u>与海关管理局签订的合同的进度报告</u>

210. 与海关管理局为开发管理信息系统并将其纳入监测和监督方案的合同尚未签订。尤其是，国际环境合作中心与海关管理局正在谈判一份新的备忘录，在确定必须开展的活动之后才会签订合同。注意到项目完成前所剩时间有限，秘书处建议，中国政府通过工发组织向第八十四次会议提供谈判新的备忘录的状况和与海关管理局签订合同的最新情况，但有一项谅解，那就是如果届时仍未签订合同，拨供的资金（250,000 美元，外加给工发组织的机构支助费用 18,750 美元）[46]将在该次会议退还多边基金。考虑到完成必要安排可能需要的时间，会议同意，如有必要并在例外情况下，可在第八十四次会议口头报告最新情况，而不需按照有具体报告规定的项目的通常截止日期。

<u>2019–2021 年执行计划</u>

211. 秘书处支持在概念上建立甲基溴附加标签和追踪系统的提案，但不清楚这个系统将如何运作、建立的时间表以及是否将在国际环境合作中心编列预算，确保在项目完成后将

[45] 例如，从 2017 年 1 月至 2018 年 12 月，国际环境合作中心收到并审核了 90 件与药品、化学品、农药、精细化学品、工程和生物应用有关将甲基溴作为原料使用的申请，并定期对这些用户进行现场核查，以确保申请内容属实并且将甲基溴作为原料使用的条件仍然存在。

[46] 在 UNEP/OzL.Pro/ExCom/82/20 号文件中有进一步说明。

继续得到使用和维护。工发组织指出，该系统仍处于概念阶段，一旦执行委员会批准工作计划，国际环境合作中心就会与三个甲基溴生产商、熏蒸业和业界专家进行协商，拟定这个系统应如何建构和工作的职权范围以及实施时间表。通过消耗臭氧层物质管理信息系统这个平台将确保系统的可持续性，这个平台将包括集成甲基溴数据的接口模块。秘书处建议在提交给第八十四次会议的年度进度报告中列入关于甲基溴附加标签和追踪系统的最新情况。

212. 根据 2019-2021 年的执行计划以及中国政府在项目完成后继续实施上述活动的承诺，秘书处认为，在甲基溴生产行业淘汰计划完成后对甲基溴继续进行长期和可持续的监测意义重大。

**秘书处的建议**

213. 谨请执行委员会：

(a) 注意到第 UNEP/OzL.Pro/ExCom/83/11/Add.1 号文件所载关于制定管理信息系统及其结合到海关管理局实施的监测和监督方案的合同的进度报告和对工作计划的更新，以便在完成甲基溴生产的行业淘汰计划后，确保长期和持续地监测甲基溴；

(b) 请中国政府通过工发组织向第八十四次会议提供关于制定管理信息系统及其结合到海关管理局实施的监测和监督方案的合同的最新情况，但有一项谅解，即如果在举行会议的第一天仍未签订这项合同，则与这项活动有关的 250,000 美元和给工发组织的机构支助费用 18,750 美元将退还多边基金；和

(c) 请中国政府通过工发组织在依照第 82/19 号决定向第八十四次会议提交的关于中国淘汰甲基溴生产的行业计划执行情况年度报告中列入有关甲基溴附加标签和追踪系统的最新情况。

**Review of China's Current Monitoring, Reporting, Verification and Enforcement Systems in accordance with HCFC Consumption and Production Phase-out Management Plan Agreements**

**Table of Contents**

## 1. Introduction and background

### 1.1 Introduction

In Decision 82/65 and Decision 82/71, the Executive Committee (ExCom) requested the Government of China, through the relevant implementing agency: i.) to submit, at the 83rd meeting, a review of the current monitoring, reporting, verification and enforcement systems in line with its Agreements with the Executive Committee on the country's HCFC phase-out management plan and HCFC production phase-out management plan, including information on the organizational structure and capacity at the national and local levels that demonstrated how the long-term sustainability of the phase-out of HCFCs in the consumption and production sectors was being ensured and on the efforts to address any illegal trade in those substances; and ii.) further to submit, at the 83rd meeting, a progress report regarding actions taken with a view to strengthening of legislation on ODS and implementation thereof in China.

The objective of this report is to provide the ExCom, in accordance with its relevant decisions, with a comprehensive review of the current mechanism of China's ODS control and phase-out, which includes: i.) information on the compliance framework to the Montreal Protocol in China; ii.) current monitoring, reporting, and verification under China's Stage I and Stage II HCFCs Phase-out Management Plans; iii.) Enforcement review and action plan. This report also provides the basis for the ExCom's consideration to Stage II HPMP tranche request and HPPMP for China at its 83rd meeting.

### 1.2 Structure of the report

This report consists of five chapters. Chapter 1 introduces general background and objective of this report.

Chapter 2 summarizes the compliance framework to the Montreal Protocol in China, where the ODS management system and relevant laws and regulations are reviewed respectively.

Chapter 3 details the current monitoring, reporting, and verification under China's Stage I and Stage II HCFCs Phase-out Management Plan. Followed by a review on HCFCs phase-out at the national level, detailed MRV under HCFCs production and consumption sector is presented. Efforts to address illegal trade and how the long-term sustainability of the phase-out of HCFCs was being ensured are demonstrated as well at the end of this chapter. This chapter also sums up lessons learned during the implementation.

Chapter 4 reviews the overall situation on ODS enforcement in China where challenges are identified as well. This chapter also outlines the action plan to strengthen legislation and its implementation.

The last chapter assesses the challenges in achieving the compliance targets and urgent need of approving tranches of HPMP and HPPMP.

### 1.3 The Montreal Protocol and China

China acceded to the Vienna Convention for the Protection of the Ozone Layer in 1989 and the Montreal Protocol on Substances that Depleted the Ozone Layer (hereinafter referred to as the Montreal Protocol) and the London Amendment in 1991 and compiled the China's

Country Program for Ozone Depleting Substances Phase-out (hereinafter referred to as Country Program) for guiding the phase-out activity in 1993. Subsequently, China ratified the Copenhagen Amendment in 2003 and the Montreal Amendment and the Beijing Amendment in 2010. As a responsible country, the Government of China is actively fulfilling the obligations specified under the Montreal Protocol. Under the principle of "common but differentiated responsibilities", China stands ready with the international community to seriously implement the Montreal Protocol as always to protect the ozone layer and address climate change.

With great efforts in the last 30 years, China has achieved the phase-out of five main ODS and completed the first stage of HCFCs phase-out. China completed the phase-out of the production and consumption of CFCs and Halons on July 1st 2007, two and a half year earlier than the phase-out schedule of the Montreal Protocol. Until January 1st 2010, except for essential use, China had completely phased out the production and consumption of CFC, Halon, CTC and TCA (5 year ahead of schedule). Then, China realized the total phased-out of production and consumption of Methyl Bromide in controlled use by January 1st 2015. Subsequently, guided by a series of national strategies and strong political commitment, China has completed the first stage of HCFCs phase-out, having achieved HCFC freeze target at 2013 and 10% reduction target at 2015. During the first stage of HCFCs phase-out, China has phased out 71,000 MT of HCFCs production and 45,000 MT of HCFCs consumption, closed down 88,000 MT production capacities, meeting the targets specified for Stage I HPMP and HPPMP in advance. So far, China has in total phased out over 280,000 MT of ozone depleting substances (ODS), accounting for more than fifty percent of the amount phased out in developing countries. Moreover, for maximize the climate benefit, 76% of the HCFC phase-out projects in Stage I HPMP adopted low GWP alternatives.

### 1.4 Multilateral Fund and China

As an article 5 country, China advocates the establishment of multilateral funds to provide financial support to developing countries. During 1991-1997, project by project submission and approval has been the predominant modality for funding ODS phase-out. In 1997, China Halon phase-out sector plan was approved at the ExCom's 23rd Meeting, marking the turning point from a project-by-project approach to the performance-based multi-year sector approach. The sector approach was more effective in phasing out ODS than project-by-project approach by combing the policy and regulation activities in the implementation.

For the sustainable phase-out of ODS, China implemented its country program with the principle of four synergies among production phase-out, consumption transition, formulation and implementation of policies and regulations, and development of alternatives. Over 400 projects and 31 sector plans have been developed and implemented with supports from the Multilateral Fund in achieving the complete phase-out of production and consumption of controlled uses of CFCs, halons, carbon tetrachloride (CTC), methyl chloroform (TCA) and methyl bromide (MBr), and the first stage of HCFCs phase-out of controlled uses in both production and consumption sectors. During the implementation of Multilateral Fund projects, China has developed a compliance mechanism which includes monitoring, reporting, verification systems in accordance with the relevant guideline, policies and requirements established by the Multilateral Fund, and has effectively supervised the phase-out activities and its results. The compliance mechanism has been continuously strengthened and improved over time, laying the foundation for the subsequent supervision and management of HCFCs phase-out.

China is the largest country of HCFCs production, consumption and export. HCFCs phase-out in China involves several industries including chemical production, PU foam, XPS foam, room air conditioning, industrial/commercial refrigeration and air conditioning, solvent and

servicing sectors. HCFCs production industries and HCFCs-consumed manufacturing industries have a great implication on the economy and employment of China. The transition from HCFC to environmentally friendly alternatives is full of challenges and complexity in terms of alternative technology, market and industry scale. China's compliance is crucial to the success of the Montreal Protocol due to its high global share.

In 2011, the 64th and 65th Meeting of the ExCom of the Multilateral Fund approved Stage I of the HCFC Phase-out Management Plan (HPMP) for China for polyurethane (PU) foam, extruded polystyrene (XPS) foam, industrial/commercial refrigeration and air conditioning (ICR), Room air conditioning (RAC), Solvent sector and Servicing and Enabling Component to phase out 3,386 ODP tons of HCFCs consumption. The agreement between the Government of China and the ExCom was updated several times and finalized at the 67th meeting. In 2013, the ExCom approved Stage I of the HCFC Production Sector Phase-out Management Plan (HPPMP) for the period 2013-2016. According to the Stage I of HPPMP and for the purpose of achieving the freeze target in 2013 and 10% reduction target in 2015, China had planned to phase out about 3,970 ODP tons HCFCs production at the first Stage.

At the 76th and 77th meetings, the ExCom approved Stage II of the HPMP for China for 6 consumption sectors to reduce HCFCs consumption by 37.6% of the baselines by 2020 and the total phase-out of HCFCs in the PU foam, XPS foam and solvent sectors by 2026. The 79th ExCom meeting approved the Agreement between the Government of China and the ExCom for the implementation of Stage II of the HPMP. The approval of the overall Stage II HPPMP has been delayed, with a bridging fund approved on an exceptional basis at the 81st ExCom for production closure or quota reduction to meet the 2018 compliance target.

According to the Agreements for Stage I/II HPMP and HPPMP, China should meet the annual production and consumption limits of HCFCs including the national level and sector level. The Agreement also stipulates conditions for funding release, monitoring, flexibility, responsibilities of the country and bilateral and implementing agencies, non-compliance issues etc. For the monitoring of Stage I/II HPMP and HPPMP, China will ensure accurate monitoring of its activities under the agreements and will establish and maintain a system to monitor the production and consumption to ensure compliance with the targets. The reporting and monitoring requirements are listed in the appendix of the agreements; these are attached as annexes of the report.

## 2. Compliance framework to the Montreal Protocol

### 2.1 ODS management system in China

#### 2.1.1 National-level organizational structure

**National Leading Group for the Protection of the Ozone Layer and its Office.** The National Leading Group for the Protection of the Ozone Layer (hereinafter referred to as the Leading Group) was set up in 1991 by the Government of China. The Leading Group is responsible for the coordination of critical matters related to the compliance with the Montreal Protocol, review of guiding principles and policies for compliance, review the compliance programme and work plans and oversee the implementation of the work plans, and deal with emerging issues which require the considerations of the Leading Group. As the coordination mechanism for ozone layer protection at central level consisting of 18 ministries at its beginning, the Leading Group has been adjusting its members constantly with the institutional reforms of the

Government of China in the past years. With the most recent restructuring of government agencies undertaken in 2018, the Leading Group is now composed of thirteen ministries. Ministry of Ecology and Environment (MEE, formerly known as MEP), as the leading ministry of the Leading Group, is responsible for the supervision and examination of the implementation of the Montreal Protocol, organization of compliance activities and formulation of policies and measures. Its specific work is undertaken by the Office of the leading group.

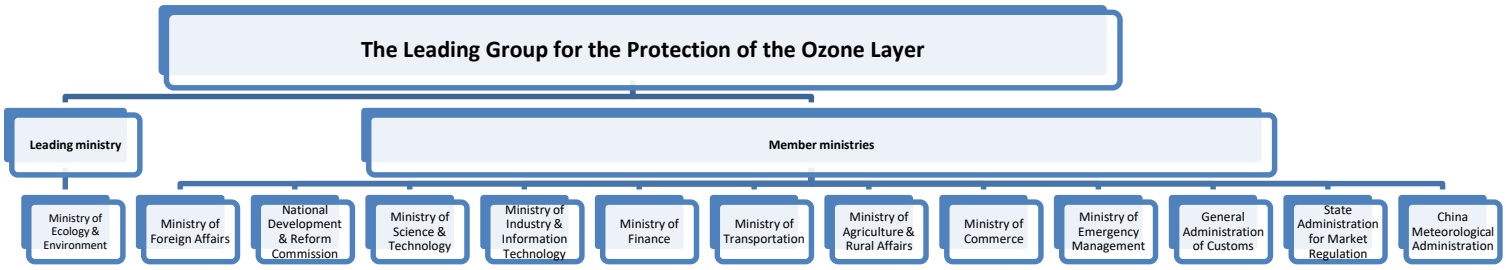


Figure 1 The Leading Group for the Protection of the Ozone Layer

**National Management Office for ODS Import and Export.** National Management Office for ODS Import and Export (hereinafter referred to as the I/E Office) was co-established by three ministries, including MEE, Ministry of Commerce (MOFCOM) and General Administration of Customs (GAC) in 2000. Its main responsibilities are the daily management of import and export of controlled ODS as authorized by the three ministries. MOFCOM's responsibilities are issuing import & export license to traders and formulating import & export catalogue of controlled ODS of China. GAC is responsible for ODS border management, transforming the catalogue to HS codes, ODS import & export data statistics; supervision, inspection on and release of ODS imports and exports, coordination on the formulation of ODS import & export regulations and policies, and fighting against illegal ODS trades. China's custom branches on borders are under the vertical management of GAC.


Figure 2 National Import and Export Management Office

**Coordination Group for the Compliance with the Montreal Protocol within MEE and its Office (National Ozone Unit)**. Coordination Group for the Compliance with the Montreal Protocol within MEE (hereinafter referred to as the Coordination Group) consists of 9 departments and affiliated agencies of MEE, whose specific work is undertaken by its Office. The Office of the Coordination Group, which undertakes the daily work of the Office of the Leading Group internally, functions as the National Ozone Unit (NOU) of China. As the national focal point of the Protocol and the MLF ExCom, The Office is responsible for daily liaison with the Ozone Secretariat, MLF Secretariat and the international implementing agencies. The Office of the Coordination Group is set up under the Department of Atmospheric Environment, MEE, with Department of Atmospheric Environment, Department of International Cooperation and FECO as members.

**Industrial associations and research institutes.** The Government of China cooperates closely with relevant industrial associations and research institutes, which mainly participate in data

survey of ODS sectors and potential beneficiaries, research of alternative technologies, formulation of sector phase-out roadmaps and, providing technical consultancy in the development and preparation of conversion project documents and sector plans, providing suggestions to government in the formulation of relevant policies. Industrial associations are also responsible for assisting relevant departments in implementing compliance policies and requirements.

#### 2.1.2 Local EEB and other authorities

Local ecology and environment bureaus (former local EPBs), together with other relevant competent authorities in thirty-one provinces, autonomous regions and municipalities directly under the central government of China have established provincial mechanism for ozone layer protection, which are responsible for: 1) implementing ODS policies, regulations and regulatory documents issued by central government, formulating provincial policies and regulatory documents, for example controlling new construction, reconstruction and expansion projects of ODS and ODS-based products through construction projects management system and environmental impact assessment system; 2) supervising and inspecting the production, consumption, sale, import and export of controlled substances; 3) conducting trainings on environment management and enforcement officers and enterprises; 4）organizing activities to raise the awareness of the public to protect the ozone layer. Besides, local EEBs provide assistance for the implementation of HPMPs, including selecting potential beneficiaries, cross checking ODS production and consumption data, conducting environmental assessments and promoting alternative technologies, etc.

### 2.2 ODS laws and regulations in China

The Government of China formulates relevant laws, regulations, rules and regulatory documents to support comprehensive domestic compliance in China.

#### 2.2.1 Laws

Approved by the National Peoples' Congress, the *Law on Air Pollution Control and Prevention of the People's Republic of China* (hereinafter referred to as the Law on Air) was revised in 2014 and came into effect in 2015. Article 85stipulates that "the State encourages and supports the production and use of ODS alternatives, reduce the production and use of ODS step by step until complete phase-out. The State implements total amount control and quota management on ODS production, use, import and export. Specific measures shall be prescribed by the State Council".

#### 2.2.2 Regulations on Administration of Ozone Depleting Substances

The *Regulations on Administration of Ozone Depleting Substances* (hereinafter referred to as the Regulations), formulated by the State Council in accordance with the stipulations of the Law on Air and came into force on June 1, 2010, is the most comprehensive special regulation on ODS control in China. The Regulations consists of 6 chapters and 41 articles, which are Chapter I General Provisions, Chapter II Production, Sale and Use, Chapter III Import and Export, Chapter IV Supervision and Inspection, Chapter V Legal Liability and Chapter VI Supplementary Provision. The Regulations establishes total amount control and quota management system, stipulating lifecycle management on the production, sale, use, import

and export of ODS. The Regulations also defines that local EEBs and relevant departments at or above the county level shall be responsible for the supervision and management of ODS within their regional jurisdiction.

Table 1: The Regulation on Administration of Ozone Depleting Substances

| Chapters | Chapter Names | Main contents |
|---|---|---|
| Chapter I | General Provisions | • formulation and publish of the controlled list of ODS;<br>• lifecycle management on ODS production, use, disposal, recycling and destruction required;<br>• polices formulation required;<br>• encouragement of alternatives and alternative technologies; |
| Chapter II | Production, Sale and Use | • scope of application of quota and registration management;<br>• conditions of quota application;<br>• procedures of issuing quota; |
| Chapter III | Import and Export | • license management on ODS import and export required;<br>• responsibilities of MEE, MOFCOM and GAC |
| Chapter IV | Supervision and Inspection | • requirements on ODS supervision and inspections for environmental protection authorities, especially at local levels |
| Chapter V | Legal Liability | • punishment on illegal behaviors |
| Chapter VI | Supplementary Provision | • date of entry-into-force |

### 2.2.3 ODS rules and regulatory documents

MEE, MOFCOM and GAC jointly formulated the *Management Measures of Import and Export on ODS (Ministerial Letter NO. 26)* in order to strengthen ODS important and export management. The document was revised recently in 2014.

Meanwhile, over a hundred supporting policies, regulatory documents and management documents such as bans have been formulated and issued by MEE or members of the Leader Group jointly in order to phase out ODS as per the requirements of the Montreal Protocol. A lifecycle management on ODS, especially HCFCs, based on the above organizational and legal system has therefore been conducted to ensure that ODS consumption and production phase-out are sustainable. Bans on construction projects of new, renovated and expanded ODS production capacity have been implemented through construction project management and environmental impact assessment systems so that the source of ODS production is curbed in line with the phase-out schedule. Quota management has been applied in the management of controlled ODS to reduce production, use, import and export of ODS step by step. Quota and registration management on HCFC production and consumption has been implemented since 2013 in order to ensure the phase-out of HCFCs according to the stipulation of the Regulations.

Table 2: Main policies on ODS management

| Classification | Policy |
|---|---|
| Management on new construction, reconstruction and expansion projects | **Circular on Management of Establishment of ODS Production and Consumption Facilities (MEP Letter No. 2018-5)** |
| Production and consumption quota management | Circular on Implementation of Quota License for Production of Halon Extinguisher (NEPA Letter No. 1997-764) |
| | **Circular on Strengthening Management of HCFC Production, Sale and Consumption (MEP Letter No. 2013-179)** |
| Import and export management | **Management Measures of Import and Export on ODS (Ministerial Letter NO. 26)** |
| | **China import and export list of controlled ODS (six batches)** |
| Bans | Circular on the Ban of the Re-deployment of Halon Fire Extinguishers in Non-essential Places (MPS Letter 1994-94) |
| | Circular on the Ban of CFCs in Aerosol Sector (NEPA Letter 1997-366) |
| | Ban on the Use of CFCs in New Automobile Production in China's Automobile Sector (MMI Letter 1997-099) |
| | Ban on the Use of CTC as Solvent (MEP Letter 2003-69) |
| | Circular on the Ban of Use of CFC-113 as Solvent (SEPA Letter 2004-449) |
| | Ban on the Production and Use of Trifluorotrichloroethane (2005-60) |
| | Ban of the State Tobacco Monopoly Administration and SEPA on the use of CFC-11 as tobacco expansion agent in the tobacco sector (2006-2) |
| | Announcement of the State Grain Administration and the SEPA on the Complete Cessation of the Use of Methyl Bromide in the Grain Storage Industry (2006-4) |
| | Circular on the Ban of Production of CFCs (SEPA Letter 2007-43) |
| | Ban on the use of chlorofluorocarbons (CFCs) as foaming agents (2007-45) |
| | Ban on the production, sale, import and export of household electrical appliances with chlorofluorocarbons (CFCs) as refrigerants and foaming agents (MEP Letter 2007-200) |
| | Ban on the use of methyl bromide in the tobacco sector (2008-1) |
| | Circular on the Ban of Production and Use of TCA (MEP Letter 2009-39) |
| | Ban on the use of CFCs in the production of non-inhaled medicinal aerosols (2013-9) |
| | Ban on the use of methyl bromide in agriculture sector (MOA Letter 2552) |
| | **Announcement on the Ban of Production of Refrigerator Freezer Products, Refrigerated Container Products and Electric Water Heater Products with Fluorodichloroethane (HCFC-141b) as Blowing Agent (MEE Letter No. 2018-49)** |
| Alternative management | Catalogue of Guidance on Industrial Structure Adjustment |
| | Circular on Issue of Catalogue of Recommended ODS Alternatives (Revised) (SEPA Letter No. 2007-185) (the Catalogue is being updated) |
| Supervision management | Circular on Strengthening the Supervision and Management of Local Environmental Protection Bureaus in the Protection of the Ozone Layer (NEPA Letter No. 1997-185) |
| | Circular on Strengthening the Management of Phase-out of Ozone Depleting Substances (SEPA Letter No. 2007-40) |

Ecology and environmental authorities at national and local levels take different responsibilities in ODS management. ODS management, therefore, are conducted currently through a two-tier modality at national and local level as per the stipulation of the Regulations. Details are showed in Table 3.

Table 3: ODS Management at national and local level in China

| | |
|---|---|
| **National Level** | Production quota management |
| | Consumption quota issued (exemption, critical use, HCFCs >100 mt ) |
| | Import/Export license |
| | Registration for feedstock use |
| | Registration for HCFCs sales (>1000 mt) |
| **Local Level** | Ban on new construction project of ODS production and consumption except feedstock use |
| | Registration for HCFCs sales (<1000 mt) |
| | Registration for HCFCs consumption (<100 mt) |
| | Registration of ODS recycling/reuse/destruction at provincial level |
| | Registration of servicing with ODS at county level or above |
| | Supervision on enterprise level and law enforcement |

## 3. Monitoring, reporting and verification under Stage I and Stage II HCFCs phase-out

### 3.1 Review on implementation of HCFCs phase-out at the national level

#### 3.1.1 HCFCs phase-out overall progress of Stage I and Stage II

Since the approval of Stage I of the HPMP in 2011 and Stage I of HPPMP in 2013 by the ExCom, China has achieved significant progress in HCFCs phase-out and met compliance targets of 2013 freeze and 2015 10% reduction. At the first stage, the production sector phased out about 71,000 MT of HCFCs and closed down 5 production lines with a total production capacity of 88,000 MT. For the consumption sectors, 154 enterprises in the 5 manufacturing sectors conducted conversion projects with a total phase-out of 42,012 MT. Table 4 below are the numbers of conversion projects in 5 manufacturing sectors and associated amounts of phase-out under the Stage I HPMP. The refrigeration servicing sector contracted 18 training centers, trained about 5,000 technicians and made significant development in standard establishment, supervision of import and export, conducting public awareness and capacity building.

Table 4: Conversion projects for Stage I of HPMP

| Sector | Number of lines/ enterprises | Phase-out Amount (MT) |
|---|---|---|
| **PU foam** | 57 | 12,969 |
| **XPS foam** | 25 | 9,590 |
| **Solvent** | 9 | 610 |
| **RAC** | 29 | 10,814 |
| **ICR** | 34 | 8,029 |
| **Total** | **154** | **42,012** |

The HCFCs phase-out in the production sector achieved great climate benefit. The total climate impact from HCFCs reduction from the 2010 production level during 2013 to 2017, including the impact from HFC-23 emission reduction over those years, represents about 1,165 million tons of $CO_2$ eq.

At the 76th and 77th meetings, the ExCom approved Stage II of the HPMP for China for 6 consumption sectors for the period 2016 to 2026 in the amount of US$500.1 million, to reduce HCFCs consumption by 37.6% of the baseline by 2020 and to achieve complete phase-out of HCFCs in the PU foam, XPS foam and solvent sectors by 2026. With the first two tranches approved (except for the PU foam sector), conversion contracts with 61 enterprises resulting in a total phase-out amount of 10,251 MT have been signed. The 80th ExCom meeting approved on an exception basis US$23m to enable the maximum allowable level of HCFCs production for 2018 at 22,742 ODP tons. A production line closure contract was signed with Zhejiang Sanhuan to phase out 3,182 MT of HCFC production. 23 HCFC production quota reduction contracts were signed with 18 producers resulting in a phase-out of 13,028 MT.

China has made progress in implementation of Stage II of the HPMP. Market of the low GWP alternatives is growing through the joint efforts by the government, industries and stakeholders. Continued efforts through the implementation of HPMP and HPPMP are necessary to keep the momentum and ensure the compliance target and other objectives of the projects to be achieved.

**Development of alternatives to HCFCs for sustainable phase-out.** In line with the spirit of decision 19/6 of the meeting of parties, the government of China and relevant industries has made great efforts to promote ozone and climate friendly technologies to HCFCs to avoid the transition to high GWP HFCs as much as possible. Since 2010, eight innovative demonstration projects for the low GWP alternatives in PU foam, XPS, RAC, ICR and solvent sectors has been developed and implemented in China. To facilitate the transition to low GWP alternatives, a large amount of research and development, risk assessment, standard establishment and revision, ender user demonstration, and public awareness activities were carried out by MEE, line ministries, local governments, academic institutions and industries. Among all the conversion activities at Stage I, natural refrigerants or low-GWP alternatives account for about 76%, medium-GWP alternatives for 10%, and the percentage of high-GWP transitional substitutes at no more than 14%. The percentage of environment-friendly alternative technologies is higher than the goal of sector plans, especially for the foam and solvent sectors in which 100% of low-GWP technologies were adopted. With the adoption of the low-GWP alternatives, an estimated emission reduction of 86.3 million $CO_2$ eq. tons annually could be achieved. At the second stage, China raised its ambition of transition to green economy. All sectors selected ozone and climate friendly technologies to replace HCFCs. The temporary transition from HCFCs to high GWP HFCs will not be funded in the HPMP supported by the Multilateral Fund.

The technology choice for different sectors in the Stage-I HPMP is shown in the table below.

Table 5: Alternative technologies of each sector

| Sector | Alternative technologies for Stage I | Alternative technologies for Stage II |
|---|---|---|
| **PU foam** | Hydrocarbon (86%), water (14%) | Hydrocarbon, water, HFO |
| **XPS foam** | $CO_2$ (100%) | Optimized CO2 |
| **RAC** | R290 (71%), R 410 (29%) | R290, CO2 |
| **ICR** | HFC-32 (53%), $NH_3/CO_2$ (12%), R 410 (29%) HFC-134a (6%) | CO2, NH3, NH3/CO2, HFO, HC, HFC-32 |
| **Solvent** | Hydrocarbon (97%), HFO (3%) | KC-6, Hydrocarbon, HFE |

Considering alternative technologies facing with many obstacles in development and application, a series of technical assistance activities were conducted to remove technical barriers, assist in a smooth transition to low-GWP alternative technologies and facilitate sustainable phase-out of HCFCs. These activities include technical and product standard revision/formulation, research and optimization of alternative technologies, safety standard and measures, provincial monitoring, training etc. Major TA activities on alternative technologies in each sector are as following:

**XPS foam sector plan:** TA activities include formulation and revision of standards on XPS foam board for thermal insulation, study on new flame retardants and optimization of $CO_2$ technology, and revision of a White Book for Safe production with $CO_2$ technology etc., which supported and promoted HCFCs phase-out in the XPS foam sector.

**PU foam sector plan:** Over 20 TA activities were designed to promote the application of alternative technologies and sustainable HCFC-141b phase-out in China. A safety standard for using HC alternatives in PU foam was drafted. A series of studies on optimizing alternative technologies in different subsectors were conducted. Provincial monitoring activities including random sampling detection were designed and implemented to monitor the compliance of the PU foam enterprises in key regions. Ban on the Manufacturing of Refrigerators, Freezers, Reefer Containers and Electric Water Heaters Using HCFC-141b as Blowing Agent was issued in 2018 and came into force since 2019.

**Solvent Sector plan:** Training and workshops were organized to communicate latest information about the alternative technologies and facilitate experience sharing among enterprises. HCFCs Phase-out Technical Conversion Guideline in the Medical Devices Sub-sector was prepared and disseminated to relevant enterprises.

**RAC sector plan:** Research on R-290 technology was conducted including experiments and risk assessment on leakage of R-290, performance optimization of R-290 compressor based on reduced lubricant use, refrigerant charge reduction through the use of microchannel technology, and existing efficiency codes and standards on refrigerant uses.

**ICR sector plan:** Studies on the application of low-GWP alternative technologies were conducted to assist in their adoption, including R-32 water chiller and unitary air-conditioning, water chillers using HFO/HFO blends, R-290 commercial heat pump, Ammonia/$CO_2$ in refrigeration and food storage, $CO_2$ heat pump and $CO_2$ technology in supermarkets. Revision of 11 technical and product standards were completed. Revision of the National Standard for Safety and Environmental Requirements for Refrigeration Systems and Heat Pumps (GB-9237) to allow for the use of flammable refrigerants has been completed and the revised standard went into effect on 1 July 2018. Market of the above low GWP alternatives in China is growing.

**Refrigeration servicing sector:** TA activities include establishment of training centers, training technicians/trainers on good servicing practices and handling R-290 refrigerant, distribution of training publications on good servicing practices for refrigeration and air conditioning equipment. Code for transportation and installation of room air conditioner and code for servicing and maintenance of commercial refrigeration were revised and approved.

### 3.1.2 HCFCs monitoring and reporting under the overarching strategy

According to Article 7 of the Montreal Protocol, parties shall provide to the Ozone Secretariat statistical data on its annual production, imports and exports of each of the controlled substances each year. In addition, A5 parties are required to submit annual Country Program data to the Secretariat of the Multilateral Fund each year. HCFCs data were collected from production enterprises quarterly and from consumption enterprises on yearly basis. The

annual import and export data for HCFCs are from the record of the GAC. According to the HPMP and HPPMP Agreement between China and the ExCom, the World Bank shall verify HCFCs production data and import and export data each relevant year. The World Bank has been carrying out yearly verification to all the production enterprises and verification on the import and export data since 2013. The detailed verification reports were submitted to the Secretariat of the MLF and the Executive Committee for its review. The verification reports were treated as the confidential documents only available to the MLF Secretariat and the ExCom members because it contained a large amount of corporate business information. The HCFCs data in the A7 and CP data submitted by China are consistent with the verification report and the recorded import and export data by the GAC. National HCFCs consumption was calculated in line with the definition of the Montreal Protocol. The consumptions at the sector level were determined according to the methodology in the HPMP agreement and data collected through the quota system, national statistics and other relevant information collected by the industrial associations. The A7 data and CP data submitted by China showed that China has met the HCFCs phase-out targets as schedules both at the national level and sector level from 2013 to 2017.

Table 6: HCFC Production and Consumption of China for 2013-2017 (ODP tons)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Production target | 29,122 | 29,122 | 26,210 | 26,210 | 26,210 |
| Actual production | 26,599 | 27,180 | 21,899 | 21,514 | 21,671 |
| Consumption target | 18,865.4 | 18,865.4 | 16,978.9 | 16,978.9 | 16,978.9 |
| Actual consumption | 17,196 | 16,839 | 13,485 | 14,221 | 14,605 |

As China has large HCFC production, export and consumption, involving chemical production, PU foam, XPS foam, RAC, ICR, refrigeration servicing and solvent sectors, it requires effective and efficient coordination at the national level to ensure phase-out targets are achieved in a collective manner. Coordination meetings were held each year with participants from international implementing agencies, bilateral agencies, MEE, industrial associations, research institutes and other stakeholders. Coordination meetings enabled regular monitoring and review of the progress of seven sector plans and facilitated collective actions to ensure smooth implementation of the sector plans. With management and monitoring at the national level, review and submission of annual progress reports and implementation plans were timely submitted to the Executive Committee as required.

The 70$^{th}$ meeting of the ExCom requires the implementing agencies to submit an annual audited financial statement to be provided by FECO/MEE including funds received from implementing agencies, disbursement to final beneficiaries and interest earned on the balance of Stage I of HPMP. Similar decision was made when Stage I of HPPMP was approved. Financial audit reports were prepared by the qualified independent accounting firm and submitted to the Secretariat of the Multilateral Fund from 2012 to 2017. The accrued interest from HPMP and HPPMP in those projects was offset against the new tranche approvals according to relevant decisions of the ExCom.

### 3.2 Management and monitoring on HCFCs production

#### 3.2.1 HPPMP Agreement provisions and obligations

At its 69th Meeting, the Executive Committee approved China's Stage I HPPMP to assist China in meeting the 2013 freeze and the 2015 10% reduction of China's Montreal Protocol HCFC production baseline (Decision 69/28).

More specifically, the requirements of the framework agreement for total phase-out of HCFC production for controlled uses includes the following:

a) The amount of HCFC production for controlled use to be phased out by the HPPMP is 445,888 tons based on verified 2010 ODS production data.
b) To retire an additional 24 percent (107,013 MT) of the production capacity based on the tonnage of 445,888 MT.
c) To close and dismantle the production lines producing HCFCs only for controlled uses in 2010.
d) To ensure that any compensated plant does not redirect any phased out HCFC production capacity towards feedstock.
e) Funding for Stage I and beyond should be used to prioritize total permanent closure and dismantling of production lines.
f) To optimize the implementation of HPPMP in order to minimize environmental and climate impacts as much as possible, including by giving priority to HCFC production closure to achieve HCFC reduction targets set forth in the MP Decision XIX/6.

#### 3.2.2 Monitoring, reporting and verification under HPPMP

In order to achieve the compliance targets of HCFC production sector, the government of China issued specific policies to ensure the implementation of HPPMP, established a tradable production quota management system covering all producers and all HCFCs, issued annual total and domestic use production ceiling according to the targets set up in HPMP and HPPMP Agreement, developed registration mechanism for HCFC sales and feedstock uses, operated an on-line management information system (MIS) for quarterly data reporting of monthly production, and implemented the open bidding for production line closure and proportionally quota reduction. Besides that, China continuously strengthens its supervision of HCFC production through the independent verification by the implementing agency (the World Bank) and monitoring by local EEBs. The training and communication with all producers on the production line closure, quota allocation and implementation, policy implementation, issues identified in the verification report has been organized regularly with the presence of the representatives from the international implementing agency to improve the management. Following are some details of HCFC production management.

##### 3.2.2.1 Policy Measures

a) **In 2008, MEE issued *Circular on Strict Control of HCFC Production Facilities (MEP Letter 2008-104)*, which forbids the new construction, reconstruction and expansion of HCFC production facilities for controlled use**. It also defines the requirements that the new construction of integrated HCFC production facilities and downstream feedstock use facilities should be approved by MEE before construction. Moreover, it is not allowed to exceed the capacity during the relocation or reconstruction of the existing HCFC production facilities. In view of the need for long-term management of HCFCs and the continued nature of the

negotiations on HFC phase-down, since the release of this circular, MEE suspended all applications for the establishment of new HCFC facilities for feedstock use till the year 2015 when more strict approval conditions and procedures for the feedstock use were introduced and agreed upon by the stakeholders. In the approval process for the feedstock use, a publicity procedure was introduced for greater transparency to enable social supervision. The issuance of the circular and the more rigorous approval procedure for feedstock use reduces the likelihood of overcapacity being created for of HCFC production, facilitated the long-term management of HCFCs, and decreased the emission of by-products (HFC-23) of HCFC-22.

In the year of 2018, MEE issued the *Circular on Management of Establishment of ODS Production and Consumption Facilities (MEP Letter 2018-5)* which is aimed to consolidate the construction management of all the substances. Meanwhile, the new circular replaced 9 circulars related to the construction of ODS production/consumption facilities issued before.

b) In order to meet the targets of HCFC production and consumption sectors for 2013 freeze and 2015 reduction, in line with the Regulations, ***Circular on Strengthening Management of HCFC Production, Sale and Consumption*** **was formulated and issued by MEE on 7 August 2013 (MEP letter 2013-179)**. According to the circular, MEE issues the HCFC production quota to each producer and HCFC consumption quota for the enterprises with annual consumption of more than 100 tons respectively. The circular also requires that all the HCFCs feedstock users and HCFC dealers with the annual sales volume of more than 1,000 tons (including) should register in MEE; HCFCs users for control use less than 100 tons per year and HCFC dealers less than 1,000 tons per year should register in local provincial EEBs. The Circular (MEP letter 2013-179) strengthened the management measurements on HCFCs compared to the previous policies.

3.2.2.2 Management Mechanism

a) Production Quota System for Controlled Uses

China uses production quotas to control the production of HCFCs in accordance with the control targets under the HPMP and HPPMP Agreements. Each HCFC producer is required to have a production quota license before it can produce and sell HCFCs for controlled use. Production quotas are only valid for the calendar year for which they were issued. MEE will provide each eligible HCFC producer with a two-tier quota for ODS production. The total production quota will be used to keep the ODS production within the HPPMP control targets, taking into account of imports that may take place during the calendar year. Within the total production quota, each eligible producer will receive production quota for domestic use. The purpose of the production quota for domestic use is to ensure China meets its consumption control targets under the HPMP Agreement. When applying the production quota, producers must submit the supporting documents in line with the requirements stipulated in the ODS regulation. The on-line publicity of quota allocation in the website of MEE and China Ozone Protection Actions before the approval has been ensured for information transparency and public supervision.

The production quota can be traded between eligible HCFC producers either for one year or on a permanent basis so as to facilitate the industrial rationalization of the production. Producers must request and receive approval for quota trading from MEE. Quota trading request can be applied twice each year. The information of quota adjusted will be published to the public. The quota notice will be sent to each producer and the local EEBs who are responsible for the regular monitoring of the production. The practice of tradable quota was welcomed by the industries as an economic and effective way to organize the production efficiently through co-ordination. Such mechanism also contributed to the effective monitoring of the production.

As mentioned in above, all the producers are required to report the monthly production data

to MEE on a quarterly basis. The reported data were analyzed by MEE during the year to ensure the compliance of the producers within allocated quota and to prevent potential careless mistakes of producers. The reporting data was verified by independent technical and finance experts after the year.

b) Registration Management for HCFC dealers

The enterprises that sell more than 1,000 tons (including) per year are required to register with MEE. Each year, the producers and large dealers should submit their application to MEE for the annual registration. After reviewing the application document, MEE will publish the registration information on-line, including the list of registered dealers and substances they are allowed to sell.

According to Circular (MEP Letter 2013-179), the enterprises that have an annual sale of less than 1,000 tons should register in local provincial EEBs. The sales information is helpful for MEE and local EEBs to monitor the market and consumptions.

c) Registration Management for HCFC feedstock users

Since the feedstock management is very important to ensure the sustainable phase-out of HCFC for controlled use, all HCFC feedstock users are required to register to MEE on a yearly basis. Each year, all feedstock users should apply for the registration for HCFC feedstock use. After reviewing the application document, MEE will publish all the registration information, including the list of registered feedstock users and substances they produce by using HCFCs.

Furthermore, it is required that only the registered feedstock users are allowed to purchase HCFCs from qualified HCFC producers and registered HCFC dealers. All the HCFC production for the feedstock usage by themselves and sold to domestic users and foreign users were carefully verified by the independent technical and financial experts based on the registration information of MEE, contracts and financial records.

3.2.2.3 Data Reporting

During the implementation of Stage I, a Management Information System (MIS) has been developed. Through this system, all the enterprises that are supervised directly by MEE could apply for production quota, sales registration and feedstock use registration on line and report the relevant data in a quarterly basis. The data to be reported is shown as follows,

a) HCFC producers: HCFC production, purchase, detailed sales information for different uses (including sales amount, the buyer and users), internal use, stockpile, as well as the raw material.

b) HCFC dealers: detailed purchase information (including purchase amount, the providers and users), detail sales information for different uses (including sales amount, the buyer and users).

c) HCFC feedstock users: detailed purchase information (including the providers and purchase amount), the amount and kinds of the chemicals they produced by using HCFC as the raw material.

Through the analysis and cross-check of the reported data and information, PMO could monitor the implementation of production quota for each producer, quantities of HCFC feedstock use and provide the information for the in-site monitoring and verification.

3.2.2.4 Monitoring

a) Monitoring of implementation of HCFC production quota

As mentioned above, a centralized data reporting system was established as the tool to track the implementation of HCFC production quota. Apart from date reporting system, FECO and

the international agency World Bank conducted site visits to HCFC producers each year to supervise the implementation of HCFC production quota through checking the status of HCFC production facilities and relevant production and sales records.

On the local level, EEBs are responsible for the monitoring to enterprises in line with the ODS regulations. In case the wrong-doing by enterprises are identified, local EEBs will investigate and dispose of illegal acts.

b) The supervision and verification of HCFC production closure

In order to close all the production lines only for controlled use and retire the additional 24% idle capacity as required by the HPPMP agreement, China has been giving priority to HCFC production closure and retirement. FECO along with the World Bank designed the bidding mechanism carefully to provide incentives for the closure and retirement of idle capacities. The bidding mechanism worked very well during the implementation of Stage-I HPPMP. Other measures are listed below:

i) The production line closure projects shall be strictly following the requirements of the World Bank's Environmental and Social Management Framework. The enterprises shall prepare and submit Environmental management plan, Resettlement plan, Site investigation report and Site environmental risk assessment report to World Bank for approval. If the remediation of contaminated sites is necessary, the enterprises shall also submit remediation plan of contaminated sites. The safeguard focal point of the World Bank is responsible for the review and supervision of social and environmental impact of the project.

ii) According to the project requirement, local EEBs shall supervise the procedure of production line closure and provide certificate for equipment dismantling. FECO will supervise the destruction of key equipment of the production line. The enterprises shall record such process by video or image.

iii) During the project implementation, the World Bank and FECO organized site-visits for the supervision of the project progress and achievement of agreement. In the Stage I, FECO and the World Bank organized 5 times joint site-visits for each enterprise contracted for the production line closure.

iv) After the project implementation, the World Bank will commission independent experts for the verification to confirm the achievement of dismantling and permanent destruction of production line.

3.2.2.5 Production, Import/Export verification and Feedstock verification

a) Production and Import/Export verification

As per the requirement of the agreement, China's HCFC production situation should be verified by following the Executive Committee's Guidelines and Standard Format for verification of ODS production Phase-out using the Montreal Protocol's definition of production. The annual verification is normally conducted from April to August each year. The World Bank will commission teams of independent technical and financial experts to verify the HCFC production situation, including production data for controlled and feedstock uses, facility capacity and operation status, stockpile, domestic uses, import and export, and HFC-23 byproduct emission on a voluntary basis. In addition, the verification also includes the review of production line closure project.

b) Feedstock verification

Significant HCFC quantities have been used in house by the producers themselves for the downstream production and were verified by the World Bank experts. For the registered

feedstock users purchasing HCFCs, China conducted the verification every two years to check the technical route of using HCFC and to verify the data of their purchasing records.

### 3.2.3 Lessons learned

The Stage I HPPMP has been successfully implemented by MEE with support from the implementing agency and ensured the compliance of China for the HCFC freeze target in 2013 and the 10% reduction target in 2015. A comprehensive and effective regulation and supporting policy framework, monitoring, verification, and reporting system for the HCFC production phase-out has been established and implemented. Lessons learned in this process could be summarized below:

- ODS regulation issued by the State Council on 2010 provided a comprehensive legal framework to regulate ODS in China. Circular (MEP Letter 2013-179) is explicit on the control measures for HCFCs management both on the national level and local level. The ban on the new establishment of HCFC facilities has been strictly implemented from 2008 to ensure the upstream control for the sustainable phase-out. The quota and licensing system for HCFC production, consumption, import and export, has been designed to suit the requirements and complexity of HCFC phase-out in China and were proven to be effective in achieving the phasing out target of HCFCs.

- An open bidding mechanism for production closure and quota reduction arrangement has been implemented successfully and demonstrated the feasibility to meeting the requirements in the overarching HPPMP agreement.

- A robust monitoring, verification and reporting system for HCFC production phase-out has been established in line with the HPPMP Agreement. This system includes the monitoring, verification and reporting both for the controlled use and feedstock use. The capacities of MEE, local EEBs and the implementing agency to manage the production sector of HCFCs have been strengthened through the implementation of the Stage-I HPPMP.

- Independent production verification to all producers are critical to ensure the compliance to the regulation. The recommendations of the verification report, the review and comments of the MLF Secretariat to the verification report also helped China and producers to improve the management constantly.

- The role of local EEBs for the smoothly implementation of HPPMP is very important. Apart from the specific HCFC regulation, the general environment management measures such as EIA, routine monitoring to the enterprises have been contributing to the effective HCFC production management. The safeguard policy of the World Bank ensured the properly implementation of production line closure to avoid the negative impacts to the social community and environment.

- Regular training and consultation with HCFC producers, dealers and feedstock users are necessary for the smooth and effective implementation of HPPMP. Publicity of the issuance of quota, registration of HCFC dealers and feedstock users, the review process of the establishment of the new HCFC fallibilities ensured the transparency of the relevant information, enhanced the motivation and confidence of the stakeholders in compliance, and strengthened the supervision by the public.

### 3.3 Management and monitoring of HCFCs consumption

#### 3.3.1 HPMP Agreement provisions and obligations

At the 64th ExCom meeting, it adopted Decision 64/49 to approve in principle Stage I of the HPMP for China for the period 2011 to 2015 to reduce HCFC consumption by 10 per cent of the baseline. The meeting also approved the draft Agreement between the Government of China and the Executive Committee for the reduction in consumption of HCFCs (hereinafter referred to as "the Agreement"). Subsequently, the Agreement was revised and updated at the 67th ExCom meeting as Decision 67/20.

A national maximum HCFC consumption target and separate target for five manufacturing sectors has been set out in Appendix 2-A in the HPMP Agreement. The release of tranches for a sector plan will depend on the compliance of the national consumption target, sector consumption target, the implementation progress of the annual work plan and disbursement to the final beneficiaries in the previous tranche.

The Agreement also requires China should ensure that it conducts accurate monitoring of its activities under the Agreement, and should also establish and maintain a system to monitor the consumption in the different sectors, to ensure compliance with the sector consumption limits set out in Appendix 2-A. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") should monitor and report on implementation of the activities in the previous annual implementation plans in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring should also be subject to independent verification.

Appendix 5-A under the Agreement further stipulated the roles of monitoring institutions and verification methodology. The Foreign Economic Cooperation Office/Ministry of Environment (FECO/MEP) is responsible for the overall co-ordination of activities to be undertaken in the HPMP with assistance of the Lead IA and acts as the National Ozone Unit, responsible for carrying out national policies and legislations regarding the control of HCFC. **The national consumption should be monitored and determined based on production data and official import and export data for the Substances recorded by relevant government departments in line with the Agreement**. In addition to the national system of licensing and quotas for HCFC imports, production and exports, a quota system covering enterprises using large quantities of HCFC in the different consumption sectors, where applicable, should be established to control the consumption growth, achieve the consumption reduction in those enterprises and collect the consumption data. For those sectors with large amounts of small and medium enterprises, the consumption would be managed by limiting the quantities of the relevant substances to be sold to the domestic market. FECO/MEP would closely supervise those enterprises carrying out the conversion activities in Stage I of the HPMP to ensure the phase-out target in those enterprises had been achieved. FECO/MEP would co-ordinate with the Lead IA and Cooperating IAs to facilitate the verification of the targets set in the Agreement.

The Stage II HPMP for China along with six sector plans were approved at the 77$^{th}$ ExCom meeting. Subsequently, the Agreement (Stage II) was concluded at the 79$^{th}$ ExCom meeting. Since above monitoring, reporting and verification requirements stipulated in the Agreement have been proven effective during the implementation of Stage I, the Agreement (Stage II) follows the similar monitoring, reporting and verification requirements and approaches as those of Stage I.

### 3.3.2 Monitoring, reporting and verification under HPMP

#### 3.3.2.1 HCFC consumption quota and registration management

As agreed between the Government of China and the ExCom and stipulated in the HPMP Agreement, in addition to the national system of licensing and quotas for HCFC imports, production and exports, a quota system covering enterprises using large quantities of HCFC in the different consumption sectors, where applicable, should be established to control the consumption growth, achieve the consumption reduction in those enterprises and collect the consumption data.

In response to above requirement to effectively control the consumption growth of HCFC and ensure its reduction as scheduled, MEE issued the *Circular on Strengthening Management of HCFC Production, Sale and Consumption* (MEP Letter No. 2013-179). According to the circular, all HCFC producers in China should hold quota permissions. HCFC consumers with no less than 100 MT of annual HCFC consumption for controlled uses should apply for and hold quota permissions, while those with less than 100 MT of annual HCFC consumption for controlled uses should register at the provincial environmental protection agencies. MEE is responsible for the formulation of the overall quota allocation scheme for each year. All HCFC distributors should register with respective environmental protection agencies at different levels upon their sales volumes.

Accordingly, since the year 2013, MEE, jointly with relevant government departments, have been applying the national system of licensing and quotas for HCFC imports, production and exports, and has been issuing quotas for large HCFC consumers (with annual consumption larger than 100 MT) in manufacturing sectors every year.

According to the ODS Management Regulation and the Circular, the HCFCs consuming enterprise of over 100 MT shall apply to MEE for a consumption quota for the next year before October 31 of each year, and submit supporting documentations proving that the unit is eligible for consuming HCFCs, has obtained places, facilities, equipment and professional technicians that can utilize HCFCs for manufacturing, and has approved environmental protection facilities and sound internal management system.

The MEE review the consumption quota application before December 20$^{th}$. During the review process, the reduction targets by sectors set out in the HPMP Agreement, the actual consumptions of the companies in previous years, and the status of the conversion projects supported by the HPMP will be considered for specific sector and companies. Only when the applicants meet all requirements, MEE issues the consumption quota license for the next year. MEE also copies it to the relevant provincial EEBs where the enterprises locate for their monitoring. In case of the rejection of the application, MEE shall notify the applicant in writing with the reasons. The quota system for large consuming companies was proved to be a very effective tool for the sectors with majority or significant consumption at large size enterprises such as RAC, ICR, XPS and some subsectors of PU foam. This measure advanced the transformation first in large companies who are leading the market. Foreign ownership companies also need to apply for the quota same as the local companies and are required to reduce their consumption according to the phase-out schedule of the HPMP. The information collected through this quota system has been considered in finalizing the Country Program data report to the Multilateral Fund and in the project implementation of the sector plans. All the baseline consumption data in the large size companies has been verified in the preparation of the conversion projects in the sector plan. For the sector with large amounts of SMEs, the control measure in the sector level will basically depend on the domestic production quota,

import and export control through licensing system, sales registration and user registration system at local level.

The HCFC distributors, including system houses in PU foam sector, with sale volume of HCFC larger than 1,000 MT have been registered at MEE.

**Case1： HCFCs registration practice in Shanghai**

Shanghai has established the HCFCs registration system since the year 2013, in accordance with the Circular on Strengthening Management of HCFCs Production, Sale and Consumption (MEP Letter No. 2013-179) issued by MEE. In 2014, Shanghai issued the Circular on the Registration Management of HCFC production, consumption, sales and servicing at its municipality level. Each year, Shanghai also publishes the notification on the registration management and discloses the results of registration to the public.

Shanghai so far has developed online registration system, and the operation of the system is proven effective and efficient. The registration information includes basic information of enterprises, sectors/applications, type of HCFCs, the amount of HCFCs consumption/sales, etc.

HCFCs registration information in Shanghai from 2013-2018

| Year | | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|
| Sectors | | Number of enterprises | | | | | |
| Feedstock use | | 6 | 7 | 6 | 5 | 3 | 2 |
| Controlled uses | Solvent | 15 | 15 | 13 | 13 | 10 | 11 |
| | Foam | 15 | 15 | 14 | 14 | 15 | 16 |
| | Refrigeration | 20 | 19 | 19 | 19 | 16 | 15 |
| Sales | | 41 | 46 | 47 | 48 | 44 | 33 |
| **Total** | | **95** | **100** | **97** | **97** | **88** | **77** |

3.3.2.2 Monitoring, reporting and verification on conversion sub-projects

*Baseline verification prior to the signature of sub-contract*

Since HPMP was approved, with the guidance from MEE and the national leading group, FECO shall implement the HPMP and comply with the phase-out targets. The phase-out impacts are achieved through policy implementation, conversion activities, and technical assistance activities.

In terms of conversion sub-projects, FECO disseminates and advertises the invitation of project proposals to the relevant sectors after the tranches of HPMP are approved by the ExCom and the implementation plan are agreed by the implementing agencies. Each enterprise that applies for MLF grants shall entertain the on-site baseline verifications organized by FECO. The verification team consists of the staff from the accounting firm and technical experts, which are selected by FECO through open and competitive selection. According to the TOR, the financial consultants go through the HCFCs purchase invoices and also check the enterprise's production data, bank transferring records, warehouse inventory, and other supporting

documentations to crosscheck the HCFCs baseline consumption. On the other hand, the technical expert is responsible for evaluating technical aspects, such as technical capacity, the status of equipment, the conditions of the manufacturing plants, etc., and providing technical advice that may arise during the verification. The technical expert also provides technical inputs to evaluate whether the HCFCs consumption matches with the production capacity and product data. The verification team takes photos of the production sites and verification activities. The information on the enterprise's eligibility, baseline consumption, HCFC-based equipment and other important information are collected. All the materials used during the verification should be copied and stamped by the enterprise.

The baseline consumption results are concluded in the verification report prepared by the accounting firm, including an integrated part of technical evaluation. The report is submitted to FECO for review. Based on the information in the verification report, the eligibility of the company for funding is determined. The funding level for the conversion projects is determined in accordance to the Multilateral Fund cost guideline, funding allocation criteria set up in the project implementation manual approved by the implementation agency, as well as the proposals from the beneficiaries.

*Monitoring, reporting and verification during the implementation of conversion sub-projects*

After the baseline consumption is determined, the beneficiary enterprise should prepare an implementation plan determining their selection of alternative technologies, conversion timeline, procurement plan, the equipment relevant to the use of HCFCs to be dismantled, budget plus counterpart funding, along with a commitment letter from the legal representative for the sustainable phase-out of HCFCs. The implementation plan should be subject to a decision of project evaluation panel organized by FECO. Upon the approval of the implementation plan by the panel, FECO would then sign the sub-grant agreement with the beneficiary enterprise.

In the sub-grant agreement, it is clearly stated that if the beneficiary enterprise fails to stop the use of HCFCs in accordance with the provisions of the sub-grant agreement, or continues to use HCFCs and other phased-out ODS, it will be regarded as breaching party. In the case of any breach-of-agreement situation, FECO has the right to take actions against beneficiary such as requiring beneficiary to immediately correct its breach and paying a breach penalty up to 10% of the value of the sub-grant agreement, suspending further disbursement to the enterprises, or unilaterally terminating the sub-grant agreement and requiring an immediate return of all project grants obtained by beneficiary.

Once the sub-grant agreement is signed with the beneficiary enterprise, the beneficiary should start conversion activities in line with the approved implementation plan, and apply for verifications for certain technical and financial milestones that are specified in the sub-grant agreement. After the beneficiary completes the installation of new equipment and completes the trial of using alternatives, then the implementation supporting agency (ISA) or independent technical experts will conduct the on-site verification. For the beneficiary that used MLF to procure equipment, ISA verification checks the installed equipment in line with the implementation plan, and the specifications in the procurement contract between the beneficiary and equipment supplier. If there may occur discrepancy during the verification, the ISA will have to require the beneficiary to submit explanations, and the ISA should also provide justification from the technical perspectives. The ISA also interviews with the enterprise and go through documentations such as production logs, raw material procurement invoices etc., to make sure that the beneficiary is operating well with the alternative technologies. After the verification, ISA should conclude the findings in a verification report and submit to FECO. The ISA verification report is one of the conditions to trigger further disbursement to the beneficiary in accordance to the sub-grant agreement.

An independent accounting firm will conduct on-site performance verification as well. The performance verification focuses more on the use of MLF fund and timely suspension on HCFCs. The scope of the verification includes collecting the information on the HCFCs consumption and procurement after the signature of sub-grant agreement, the date of the end point of purchasing HCFCs, and the data of using up the HCFCs stocks in the enterprise. The verification team also verifies the payment made to the equipment/raw material suppliers for purchasing HCFCs alternatives and/or new facilities, the financial records of disbursement, purchase invoice, and disposal of baseline equipment. The enterprise's financial records, including sales and production volume of final products, as well as the sales contracts and the products related to the HCFCs conversions are verified along with the documentations mentioned above. The performance verification will confirm that the MLF fund allocated to the beneficiary are all paid to the conversion activities in accordance with sub-grant agreement, and the enterprise has stopped purchasing and using HCFCs for production.

*Sub-project completion and verification after conversions*

After the beneficiary completes its conversion, adopts the alternative technologies, passes the ISA on-site verification and performance verification mentioned above, and gains the required approval from local EEB and relevant authorities, then the beneficiary could apply for sub-project acceptance. As part of the application, the beneficiary is required to provide a sub-project completion report that comprehensively describes the conversion process and the results of the conversion. FECO then organizes a commissioning team that is composed of technical experts, local EEB officials, staff from FECO and members from ISA. The representative of implementation agency has been invited to participate in the acceptance when they are available. The team usually conducts on-site acceptance.

During the acceptance, the commissioning team listens to the presentation on the sub-project implementation made by the beneficiary, and inquires how the beneficiary overcomes potential technical obstacles. The team also checks the production status using alternatives through on-site visit, and go through the verification reports, approvals from local authorities and other documents to make sure the beneficiary completed all conversion activities without breaching from sub-grant agreement. The commissioning team provides conclusion to FECO, and FECO finally issues the certificate of acceptance to the beneficiary.

Once the beneficiary receives the certificate of sub-project acceptance, it can no longer use HCFCs for production in the future according to the commitment, and local EEB will be in charge of the long-term monitoring on the enterprise's compliance. FECO provides the list of enterprises that has completed conversions to relevant provincial EEBs, and provincial EEBs will deliver the information to local level. According to the list, these enterprises can neither apply for HCFCs quota nor register HCFCs consumption at provincial level. The EEBs will include these enterprises in the monitoring list subject to the enforcement activities.

Besides the EEB's monitoring, all beneficiary enterprises are obliged to receive inspections and verifications conducted by the implementation agencies (IA) or their designated institutions. The IA verifications are usually conducted once a year to random beneficiary enterprises in line with the requirements stipulated in the Agreement between the ExCom and China. The IA verification collects information on the eligibility of the enterprise for MLF support, the baseline consumption and production facilities, the consumption of HCFCs and alternative technologies during the implementation, production data, destruction of HCFC-based equipment and other issues. The findings of the IA verification will be kept in IA's records and submitted to the Secretariat of the Multilateral Fund along with the progress report and tranche request.

### 3.3.3 Lessons learned

During the implementation of HPMP, not only had the HCFCs phase-out targets been achieved but extensive experiences had been accumulated, in particularly on the aspects of monitoring, reporting and verification. Key lessons learned are:

- The combination of financial support and specific policy measures employed by HPMP was an effective approach for achieving timely HCFCs phase-out. Conversion projects in Stage-I HPMP with supports from the Multilateral Fund enabled China to request larger enterprises to undertake conversions early and unlock the market for alternatives. The specific policy measures provided enabling environment for the transformation and essential guarantee of a level-playing field.

- The consolidated and coordinated HCFC quota and registration system for HCFC production, consumption, import and export, and the comprehensive monitoring and verification activities ensures the national targets set out in the HPMP Agreement could be achieved. ODS regulation and specific HCFC management circular provides a policy framework for the sustainable phase-out of HCFCs. The tools developed during the implementation such as the on-line production/sales reporting system, on-line import and export management system have provided necessary technical measures for the government for monitoring, verification and data reporting.

- Baseline verifications conducted by third party prior to the signature of sub-projects, performance and financial verifications of the progress milestones during the implementation period ensures the compliance of the beneficiaries to the Multilateral Fund guideline, as well as domestic policy. Qualified and independent accounting firm with support from technical experts as the third-party verification entity provides the transparency and quality guarantee for the verification results. The actual result from Stage I implementation confirms that the verifications conducted are effective, efficient and impartial.

- The registration system managed by the local EEBs plays a critical role for monitoring the use of HCFCs at the local level and particularly for SMEs. This system should be continually strengthened along with the phase-out of HCFCs. The sector with large amounts of SMEs such as the PU foam sector can be monitored with specific inspection tools provided to the local EEBs to strengthen their capacities of the monitoring and enforcement.

- Public awareness on the regulation and policy of HCFC phase-out, requirement of the Montreal Protocol, as well as the related environment and health benefits, are important activities to advance the implementation of HPMP and can facilitate the public supervision for the sustainable phase-out of HCFCs.

- In view of the technical and market challenges of the transformation to the low GWP alternatives, various technical assistance activities, particularly the training to enterprises, standards revision, risk assessment, technical research and studies for the common issues in the transition, public awareness, are very important and necessary to ensure a smooth implementation of HPMP. Special supports to the SMEs should be considered in the implementation of Stage-II HPMP to facilitate the complete transformation of the sectors.

### 3.4 Management and monitoring for sustainable HCFCs phase-out

#### 3.4.1 HCFCs Import and Export management

ODS Import and Export licensing system serves as a crucial measure under the Montreal Protocol to ensure the consumption compliance of the country. China has promulgated *Management Measures of Import and Export on ODS* in 1999 and then revised in 2014, providing strict import and export approval management measures for ODS in China. The I/E Office is responsible for the approval management of ODS import and export through licensing, quota, and other activities. The I/E Office has also been acting as the coordination institution for ODS import and export control in China, and has played a key role in running license system, approving import and export quota, information exchange, capacity building, enforcement support and regional cooperation. Since 1999， three ministries jointly issued six batches of announcements of the import and export list of controlled ozone depleting substances. In 2004, 31 HCFCs were added to the list and licensed for the import and export. In 2009, 8 HCFCs blends were added to the list for the license management. The import and export management system has been strengthened constantly to meeting the updated requirement of the Montreal Protocol.

According to the Montreal Protocol and HPMP Agreement, the national consumption should be monitored and determined based on production data and official import and export data for the Substances recorded by relevant government departments. To ensure the compliance of the consumption, through coordination, MEE will issue the HCFCs annual production quota and domestic production quota for controlled use for each producer in the beginning of the year. I/E office will determine the import quota of HCFCs in the year. Those quotas will ensure the national consumption is below the target set out in the Agreement. During the year, producers will adjust their actual production plan according to the actual exports of HCFCs so as to avoid exceeding the domestic production quota if the export market declined. Therefore, I/E Office plays the critical role to provide accurate export data to the producers for decision-making. This is a very challenging requirement. However, I/E Office has successfully addressed this challenge by providing an on-line system to the stakeholders.

China is currently the largest HCFC producer in the world, exporting HCFCs to more than 130 countries. The workload of running a HCFC license system is very high. For example, I/E Office reviews HCFC import and export applications for more than 3,500 batches annually, weighing up to about 150,000 tons. The Office also issues import quota for HCFC-123 and HCFC-225 totally around 100 tons annually.

The ODS Import and Export Management Online Approval System was first developed in 2009 which has largely increased approval efficiency for the I/E Office. In 2011, the System was upgraded for the public and traders to review the approval process and supervise the trade information, such as the destination country, port, chemicals and quantities case by case. In 2013, the I/E Office developed the ODS Import and Export Management Fiber-optic Cable Data Transmission System so that the approval data can be tracked in real time by the traders, I/E Office, Ministry of Commerce and Chinese Customs. By doing this, HCFC permits and customs clearance of goods can be monitored in real time. Since 2018, the paperless online system has been developed (Figure 3), and the whole process of paperless approval will be realized in the first quarter of 2019. The implementation of the on-line system not only greatly improved the work efficiency, process publicity, data accuracy, but also facilitated the monitoring, reporting and verification. An independent verification to the import and export data has been done every year through cross checking the data in the on-line system and the records of the producers.

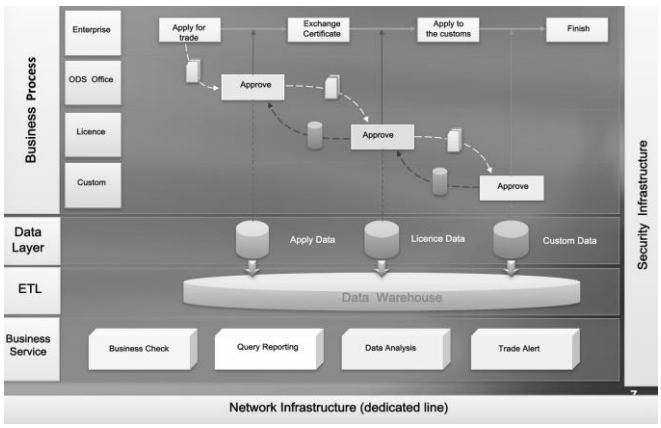


Figure 3. ODS Import and Export Management Online Approval System

To prevent illegal trade, the I/E Office carried out extensive international cooperation and worked closely with UNEP and other countries through iPIC mechanism in daily management. The I/E Office carried out iPIC with other counties approximately 350 times annually, among which 13 applications were denied in the year 2017 (weighing up to 608.6 tons), and 29 were denied in year 2018 (weighing up to 1,571.7 tons) according to the statistical data of iPIC rejection records. Although iPIC brought heavy work load for China import and export management beyond the requirement of the Montreal Protocol, the Government of China was very supportive to the operation of the mechanism in order to address the challenge of illegal trade.

Moreover, China has widely carried out South-South cooperation, exchanging import and export regulatory measures through regional network meetings, actively participating in the bilateral dialogues and responding to the information clarification requested by other countries for the A7 data facilitated by the Ozone Secretariat.

3.4.2 The implementation of MRV and enforcement for the sustainable phase-out

Actions on ODS monitoring and enforcement have been conducted both at the national level by MEE and at the local level by EEBs in the past years. MEE provided guidance for EEBs to conduct regular monitoring and enforcement on ODS. With the reported information on illegal behaviors, MEE usually took actions jointly with relevant local EEBs to crack down on them. MEE also initiated national-level inspections which focuses on key regions, key sectors or key enterprises.

The ODS monitoring program conducted by local EEBs usually consists of (a) regular monitoring and inspections related to general pollutions, and (b) special actions targeting ODS already phased out or still under control.

*The regular monitoring and inspections on general pollutions*

The regular monitoring and inspections on general pollutions are conducted by local (city/county/district level) EEBs on a regular basis. The local EEBs obtain the lists of enterprises in their regions primarily from the Environmental impact assessment (EIA) registered in the region. EIA is a regulatory requirement applied to all enterprises that want to start new business, which identifies what type of environmental management rules to be followed. The inspectors from the local EEBs focus on whether the production process is in line with the approved process, whether the raw materials used comply with the EIA and environmental regulations, and checks on essential facilities that control the gas emission, water effluent and waste management. The inspectors go through the production logs and other documentations, as well as conduct visual inspection of the production lines and warehouses. In this process,

the inspections also include to check an enterprise's HCFCs quotas or registration information when it is a HCFCs consuming manufacturer. The enterprise shall be punished if it neither applied for quota from MEE, nor did register at provincial EEB. The enterprise shall also be punished if its HCFCs consumption excesses the species or quantity in the issued quotas or information registered on provincial level.

*Special actions targeting ODS already phased out or still under control*

Special actions targeting ODS already phased out or still under control are usually the joint efforts of different branches under the local EEBs. The air environmental management branch or other branch who owns the ODS management mandates usually takes the lead role, develops work plans and coordinates with other agencies. EEB's monitoring branches are involved to collect samples and test the components in the samples. The enforcement team is in charge of the on-site inspections, and punishes the enterprise that violates the regulations in accordance with the penalties specified in the Regulations.

The special action would first come up with a work plan on targeted enterprises or sectors that will be covered. The enterprise list is compiled from registered HCFCs consumption enterprises, the enterprises with consumption quota issued by MEE, the list of MLF beneficiary enterprises provided by FECO, as well as the information collected from previous surveys and provided by industrial associations. Then the task is conducted by local inspection team organized as above described. The inspectors primarily look into the enterprise's compliance with issued quotas or registered information, visual inspection of production logs, purchase invoices and warehouse accounts. The inspectors may also take samples on-site from production lines, final products, and/or raw material warehouse. The samples are sealed with signature and sent to institutions to test the components. If the beneficiary has completed conversion and passed acceptance, there should be no HCFCs or phased-out ODS detected on-site. Otherwise, it will be imposed on punishment according to the Regulations.

**Case 2：The implementation of MRV in Zhejiang Province**

*Organizational structure and legal basis*

A provincial ODS management leadership team has been established in the EEB in Zhejiang Province and is made up of the air and environmental management division, policy and regulation division, enforcement team, the public awareness and education division, and the monitoring and environmental centers. There are about 100 people involved in ODS management in the Province. The air and environmental management division is the lead for ODS management, which is mirrored the same arrangement at the Ministry level.

The basis for all actions on ODS management, specifically HCFCs, is ODS management regulations and policies at the national level, including the MEE regulation on HCFC quota management. Provincial EEBs always in turn interpret and execute them based on their local circumstances. The Zhejiang Provincial EEB accordingly issued an ODS regulation in 2017 that strengthens HCFCs production and consumption management. A series of notices were issued to each city and county level EEB under the new rules.

*Registry of HCFC producers and consumers*

According to the regulation issued by Zhejiang EEB, all HCFC producers and users across all sectors should be subject to the registration. The registry includes consumption levels as determined by invoices, sales, the application and subsector. All consumers must register regardless of the amount of HCFCs consumption. Sellers and distributors with sales of above 1 MT must also register.

An online registry has been created and put into use whereby all enterprises must log-in to register production and consumption sales (with supporting documentation) by the end of

January of a given year. By 15 February the county level EEBs must complete the verification of uploaded documents and by the end of February, the city level EEBs will have registered enterprises. Information is subsequently publicly disclosed. If an enterprise has not registered in two years and is still producing or using HCFCs, it will be fined.

Under the first phase of the EEB capacity building activity in 2007, lists of HCFC enterprises were already collected, and updated and revised on an ongoing basis. Local EEBs were informed that they must inform new enterprises of this registration system. So far, there are 246 companies registered in Zhejiang Province registry system. FECO has regular communication with local EEBs on the status of conversion sub-projects and it informs EEBs when such sub-projects are completed, with the purpose to extending the list of enterprises to be monitored.

*Regular ODS monitoring and enforcement system in Zhejiang*

There are around 90 districts and county units and some regions have more enterprises than others so the average number of monitoring and enforcement officers is about five in less concentrated areas and 10-20 persons for more concentrated districts. These officials cover all environmental issues, not just HCFC producing/using companies. There are inspectors at multiple levels; higher levels (MEE, Provincial EEB) can also do spot checks but this usually is for the most urgent or serious issues and high-risk areas. And the regular monitoring and enforcement actions are usually taken place at city or county levels. The method of inspection includes checking production logs as well as financial records to cross check. Business licenses and other documents to prove the enterprise's legality will also be checked. Sample of products/raw materials are collected for testing when needed.

In the past year, all 246 enterprises in the registry and those completed conversion sub-projects were inspected. Zhejiang EEB incorporates ODS monitoring and supervision in the regular monitoring program. The local government provides budget (against a work plan) to regular ODS monitoring and supervision, because it's now a provincial regulation. The regulation states that inspection shall be done at least once a year.

In addition, China's industrial associations take part in monitoring and enforcement actions. The industrial associations play an important role in assisting governments in ODS management and monitoring. The industrial associations have a better understanding of relevant sectors and the market and they have provided information of the sectors and enterprises and technical suggestions for ecology and environment authorities in ODS monitoring and management. Ecology and environment authorities also invite industrial associations and individual experts to participate in enforcement actions to provide on-site technical support. The industrial associations share information with enterprises through various channels and carry out publicity and training. They also launch initiatives to encourage industry self-discipline and provide government departments with clues of illegal behaviors.

### 3.4.3 Lessons learned

- The capacity buildings carried out for customs officers and dealers in the past have made extensive impact, which effectively strengthened the capacity of ODS import and export management, article inspection, as well as combating ODS illegal trade.
- The iPIC mechanism has effectively prevented illegal trade in the past practice. China will continue to work closely with other countries through the mechanism to effectively combat ODS illegal trade, and further strengthen south-south cooperation and also provide assistance and support in capacity building and alternative technologies.

- Involvement of local EEBs in the management and monitoring of HCFCs phase-out has become extremely important. Local EEBs played key roles in ODS management, particularly in the enforcement area, in order to ensure the sustainability of phase-out impacts.

In the course of the management and monitoring activities conducted by local EEBs, there are some difficulties and challenges identified as well:

- The legal framework on ODS management will need to be further improved through issuing judicial interpretation and revision of the Regulations to provide explanations.
- There are only few qualified institutions that can provide certified testing reports, which are essential for executing enforcement on violating companies. It is expected that more testing centers will become qualified testing institutions soon.
- Even though trainings and work meetings were organized within each province, experience and practice exchanges across regions/provinces are insufficient.
- China will continue to organize training workshops for relevant enterprises and the customs, especially for the customs in the Middle and Western China, in order to continuously strengthen the capacity throughout the country.

## 4. Enforcement review and action plan

### 4.1 Enforcement review

#### 4.1.1 Overall situation of Ecology and Environment Protection in China

In recent years, the Government of China made a series of significant strategic deployment on ecological and environmental protection, constructing ecological civilization and building a beautiful China. Ecological civilization and building a beautiful China was included in the amendment to the *Constitution of the People's Republic of China* in 2018. The National Conference on Ecological and Environmental Protection held in May 2018 marks milestone in its history. General Secretary Xi Jinping attended the meeting and delivered an important speech. His thought on ecological civilization is a landmark achievement of the meeting. China has achieved great progress in institution strengthening, law development, environmental inspection, supervision and law enforcement to promote ecological protection.

**Institution strengthening through government restructuring.** In the latest restructuring, the central government decided to establish the MEE and the law enforcement team for the protection of the ecology and environment protection at all levels. The internal structure of MEE has also been enhanced to achieve a "5 integrations"—integration of surface water and underground water, integration of basins and rivers, integration of land and sea, integration of urban and rural areas, integration of carbon monoxide and carbon dioxide. Central Supervision Office of Ecological and Environmental Protection was set up as an effort to ensure that the central government's decisions on ecological and environmental protection be followed at local levels. The reform on monitoring, supervision and law enforcement departments of the country is being conducted to a deeper level.

**Improving legal system.** The Government of China has promulgated or amended nearly twenty laws including the *Law on Environmental Protection of the People's Republic of China*,

*Law on Prevention and Control of Atmospheric Pollution of the People's Republic of China*, *Law on Water Pollution Control and Prevention*, *Environmental Protection Tax Law*, etc. in a bid to implement the strictest management on ecological and environmental protection. *The Law on Environmental Protection*, revised and issued by the National People's Congress in 2014 and came into effect in 2015, formed the basic system of environmental protection in China.(Please find more details in Section 2.2.1)

**Intensifying environmental supervision.** Central environmental supervision was undertaken in thirty-one provinces, autonomous regions and municipalities in China. In 2018, Central Supervision Office of Ecological and Environmental Protection have carried out operations known as "look back" in altogether 20 provinces. In 2017, 5,600 people participated in the one-year air pollution inspection covering "2+26"cities in Beijing-Tianjin-Hebei region and its vicinity. 231,000 factories and agencies were inspected and 62,000 poorly managed, small and polluting enterprises were rectified or closed down.

**Enhancing law enforcement.** China has enhanced law enforcement in a more comprehensive way. Since the enforcement of the *Law on Environmental Protectio*n, the number of environmental cases brought to justice by environmental protection authorities in the whole country has witnessed a surge. 186,000 cases of environmental violations were investigated in 2018, with fine worth 15.28 billion yuan, up by 32% from one year earlier or 4.8 times as much as that in 2014 before the new law came into force. Through strict law enforcement, China tackled prominent ecological and environmental issues and cracked down many environmental violations. Pressure to protect environment has been effectively transmitted and the concept of ecological civilization was greatly promoted.

**Remarkable progress achieved in overall ecological and environmental protection.** Environment quality in China has been substantially improved thus far. Air, water and soil pollution control action plans have made remarkable progress. The targets of the action plan on air protection were fulfilled at the end of 2017 and the action plans on water protection and soil protection are being implemented smoothly. In 2018, PM2.5 concentration in 338 cities at or above prefectural level reduced by 9.3% comparing with previous year. Percentage of surface water better than grade III in the country increased by 3.1% and that of worse than grade V decreased 1.6%.

### 4.1.2 ODS management and enforcement actions

As a big and responsible developing country, the Government of China has always attached great importance to the implementation of international environmental agreements and taken strict law enforcement to maintain and strengthen our achievements. Since China joined the Montreal Protocol, the MEE and local EEBs have always carried out strict law enforcement, and illegal production, use or sale of ODS have been punished severely. The Government of China has always taken a consistent "zero tolerance" position towards illegal ODS related activities.

MEE continuously strikes illegal ODS behaviors. MEE conducted professional training regularly for law enforcement personnel from local EEBs, focusing on knowledge of ODS as well as introduction of relevant laws, regulations and policies on ODS. Over 50 training sessions were held with a total of about 6,000 personnel trained since 2002. Furthermore, workshops are organized annually to promote communication and experience sharing on ODS management and enforcement among local EEBs, which enhanced local EEB's capacity on supervision and law enforcement for compliance.

With the support of two phases of capacity building projects conducted in 31 provinces and municipalities and 5 cities across China since 2007, the local EEBs carried out a series of

activities and made achievements in terms of establishment of compliance mechanisms, industry and enterprises survey, formulation and implementation of local ODS management policies, supervision and law enforcement, training and public awareness due to the implementation of the projects.

All the provinces and municipalities have established compliance coordination mechanism for ozone layer protection at local government level, most of which are inter-departmental coordination organizations. All the provincial and municipal governments carried out data survey on ODS production and consumption, some also on ODS sales, import and export. The list of enterprises receiving Multilateral Fund assistance was provided by FECO to local EEBs. Besides this, local EEBs has acquired information of more ODS enterprises in their jurisdiction area through survey and registry management system.

New construction projects were strictly controlled through environmental impact assessment approval at local level to ensure that no new ODS production and consumption facilities are approved in China except for feedstock use.

Provincial governments organized training workshops on ODS management and compliance targeting city or county level officers and enterprises. The amount of officers of local EEBs and other relevant authorities which received training exceeded 35,000 and management of enterprises exceeded 13,000. There are various awareness-raising activities on ozone layer protection across the country through internet, television, schools or communities.

Based on the information on illegal ODS behaviors received through the reporting platform and other sources, the ministry and local EEBs took actions jointly to crack down ODS illegal behaviors. To strengthen monitoring of ODS consumption and sales enterprises in the PU foam sector, monitoring projects were initiated in 11 key provinces and cities since 2014. Instant detectors were equipped to local authorities to support monitoring capacity building.

From 2010 to the first half of 2018, 24 cases of illegal production, 44 cases of illegal use, and 5 cases of illegal sale of ODS were investigated and given penalty in China. Among them, there were 14 cases involving illegal production of CFC-11. About 84 tons of illegal CFC-11 were destroyed and production facilities were dismantled. Fines were imposed on four enterprises for illegal use of CFC-11.

**Case 3: Cracking down on illegal ODS production**

In 2014, according to information received from public, an enforcement team organized by Shandong EEB inspected Xushuo Chemical Company located in Lijin county Dongying city. With investigation conducted, someone rented a workshop of Xushuo Chemical Company and produced ODS illegally. After detection of materials on-site, CTC, CFC-11 and CFC-12 were proved to be contained in the products, which was confirmed as illegal ODS production. There were 18 barrels of CFC-11 (1.2 MT) and 96 barrels of CTC (13.9 MT) on-site. The production facility was destroyed by local government. Materials, products and waste water on-site had been disposed by qualified institutions. The owner of the illegal facility was transferred to the Lijin County Court for trial, which resulted in a fine of 1 million Yuan.

**National-wide ODS Law Enforcement Inspection in 2018.** Since August 2018, on the basis of regular ODS supervision and law enforcement, MEE organized environmental authorities at provincial and municipal levels across the country to launch a specialized ODS law enforcement inspection. MEE emphasized its “zero tolerance” position towards illegal ODS related activities on various occasions. This specialized inspection, on the one hand, targeted the source by extensively collecting information and tracking down illegal production. Based on clues collected, two illegal CFC-11 production factories located respectively in Liaoning

Province and Henan Province were demolished. On the spot 177.6 tons of production raw materials and 29.9 tons of illegally produced CFC-11 were seized. The raw materials and product were properly sealed up for storage, awaiting accredited entity for treatment. Suspects were transferred to judicial organ for criminal responsibilities. The inspection, on the other hand, targeted the side of ODS use by severely cracking down illegal ODS use and tracking its source. 1,172 related companies were investigated in China, as a result, in some batches of materials in 10 system houses, CFC-11 were identified after detection. Local environmental authorities filed charges and exercised punishment to the involved according to law.

4.1.3 Import and Export management and enforcement actions

The Government of China has attached great attention in combating ODS illegal trade and relevant agencies (MEE, MOFCOM and GAC) collaborated closely to clamp down the illegal import and export activities. China effectively cracked down ODS illegal trade through several special enforcement actions, including “Sky-patching”, “Goddess of the Earth”, “Shield of the Nation”, and “Green Fence Action”. International cooperation has been an important part in the above initiatives to enhance the effectiveness. Through these actions, a batch of illegal trade cases were seized, illegal trades were punished, and licensing system was strengthened. The I/E Office has also set up communication mechanism with Anti-Smuggling Bureau of China Custom, and provided technical support on risk profiling and investigation. To enhance law enforcement capacity of custom officers, the I/E Office and GAC launched the ODS import and export enforcement capacity enhancement project Stage I and Stage II with 14 pilot local customs were selected from 2012 to 2018. Activities under the project include investigation and surveys, training, public awareness and measures to enhance law enforcement etc. 24 training workshops were organized and more than 2,000 customs officers in key customs districts in China were trained. 150 ODS identifiers were provided to local Customs and distributed in main ports in China, which helped Chinese customs officers in detecting illegal ODS shipments effectively. In addition, local customs increased sampling inspection percentage of ODS and its related products, made research on features of illegal ODS trade and strengthened monitoring on key enterprises and products. The projects enhanced ODS knowledge and enforcement capacity of custom officers. With regard to illegal ODS import and export, the 17 illegal cases seized are punished as smuggling offences. Generally, they are sentenced to 1 to 3 years' imprisonment and fined 1 to 3 times of the value of the smuggled goods.

**Case4：Huangpu Customs ODS Smuggling Case**

On April 15, 2017, Zhuhai Jinying Trading Co., Ltd. entrusted Guangzhou Xuhong Customs Service Co., Ltd. with the customs declaration No. 520120160516128198 to declare a batch of stainless-steel pipes and other goods at Huangpu Laogang Customs. After investigation, the first item of the declared goods was 7,760 kg, while the actual arrival was 2,515 kg (over-reported 5,245 kg); the second item was 5,760 kg, while the actual arrival was 3,760 kg (over-reported 2,000 kg), and 6.12 tons of ARKEMA brand FORANE/R22 was found, which belongs to the ODS regulated under "China Import and Export Controlled Ozone Depleting Substances List". The found ARKEMA brand FORANE/R22 was not declared to the customs and was inconsistent with the declaration.

The party involved in this case has evaded the restrictive provisions on import and export regulation, failing to report the right name of the product. The party exported goods without license and it shall constitute an act of smuggling. The

party involved in this case was sentenced to confiscate the goods and fined three times the value of the goods it smuggled.

#### 4.1.4 Challenges

China has a large area of land with many sectors involving ODS and a long industry chain. Although China has established a comprehensive compliance mechanism and ODS management system, the country is still facing many difficulties and challenges on ODS phase-out.

China has established a sound legal framework on ODS management, however, the punishment of illegal activities is yet to be strengthened for deterrent force. Enhanced measures shall be taken to intensify punishment to the illegal activities.

Ecology and environment authorities faced with some difficulties on ODS enforcement and monitoring. After strengthened monitoring and enforcement activities over years, illegal acts were conducted in a concealed manner, without approval or registration by the government and it is becoming challenging to capture. Simple production process of the specific chemical (CFC-11) and high mobility of the illegal acts, brought difficulties for the enforcement agency to carry out a fixed enforcement plan. Effective enforcement for the hidden small illegal production relied on the precise intelligence and reporting. Internet and logistics provided convenience for illegal trading, which made trading of illegal ODS easier and difficult to trace back. Price fluctuation of the chemicals could induce the activities to violate the regulation. Due to defects of alternative technologies, remote small users who didn't receive technical and financial support to use the alternatives are vulnerable for the illegal supply of the chemicals. In terms of enforcement team, local EEBs undertaken heavy load of work on ecology and environment enforcement and could not be dedicated only for the ODS monitoring.

Due to its particularity, there are only 3 certified ODS testing laboratories in China and most of the environmental monitoring institutions do not have specific ODS monitoring instruments in their own laboratories, which cannot provide adequate support for law enforcement. Monitoring capacity including detectors and detecting institutions need to be strengthened. For the atmospheric measuring, China has developed a comprehensive air quality monitoring network for the normal air pollutants, but the atmospheric measuring on ODS is yet to be established and improved. Evaluation and assessment on ODS phase-out from the emission aspect are difficult to carry out due to lack of historical atmospheric measuring data on ODS emission.

### 4.2 Action plan to strengthen legislation and its implementation

#### 4.2.1 Further strengthening management on chloromethane enterprises

MEE will continue to strengthen monitoring on chloromethane enterprises with CTC by-production. More systematic and strict monitoring will be implemented and it will be incorporated into the pollution permit management system. Local EEBs will strengthen monitoring and increase inspection frequency on ODS enterprises within their jurisdictional area. A whole process real-time monitoring mechanism will be established at all chloromethane enterprises. Mass flow meters for CTC by-product will be installed, covering CTC measurement in its production, storage, conversion, sales, residual liquid etc. The

mechanism aims to achieve data dynamic balance under the computerized information management of CTC as well as on-line monitoring. MEE has started this work already. In addition, MEE will upgrade MIS system to incorporate feedstock production enterprises to report production data on-line.

4.2.2 Revision of the ODS Law and regulation

MEE will start revision of the Regulations to further enhance its legal effect and improve basis for enforcement. MEE will strengthen cooperation with judicial departments to connect serious illegal ODS behaviors with the criminal law, further intensify punishment on various illegal ODS behaviors and enhance deterrence force.

4.2.3 Strengthening ODS management at all levels

China will continue to strengthen routine monitoring and enforcement on ODS. ODS enforcement is listed in the 2019 work plan of ecology and environment enforcement of MEE and local EEBs that will further strengthen routine monitoring and enforcement on ODS. The government will exert strict monitoring on key industries and enterprises and strengthen inspection on quota implementation and sales of relevant enterprises. Intelligence on illegal behaviors will be widely collected. Reports on any ODS illegal behaviors by the industry or the public are encouraged and illegal behaviors will be cracked down seriously. MEE will strengthen the connection and linkage of the national and local level ODS management to integrate them systematically. Implementation of the Regulations will be improved at the local level including data reporting, registry system and law enforcement etc. MEE will increase training for enforcement personnel at local level on related regulations and policies, ODS professional knowledge, law enforcement and alternative technologies etc. to enhance enforcement capacity.

4.2.4 Measures to strengthening I&E management

Based on two phases of the ODS import and export enforcement capacity building project, Phase III will be launched to conduct cooperative work and enhancing enforcement capacity of the customs. The project will provide synergy law enforcement, technical guidance and information exchange to fight the illegal trade. Training will continue to be conducted, especially targeting form examination and inspection officers and anti-smuggling police on knowledge of goods, international conventions, domestic policies and regulations and common tricks of smuggling to increase the capacity of risk control, inspection and detection and treatment. Handy and safe instant identifiers shall be equipped to make rapid judgment whether it is ODS or not in preliminary detection. Communication with logistic companies will be strengthened to obtain direction of the goods flow and abnormal practices such as change of destinations and goods names. The I/E Office will cooperate with Shanghai Customs Academy to conduct a series of studies on the application of the criminal penalty laws in the processing ODS illegal trade in China. GAC and I/E Office will actively carry out international cooperation including IPIC mechanism, communication and experience sharing, to combat illegal behaviors effectively.

4.2.5 Enhancing ODS monitoring capacity and promote scientific research

In order to enhance monitoring capacity and meet the requirement of intensifying

enforcement, MEE released *the Notice on Constructing Monitoring Laboratory for ODS in industrial products* in 2019 on construction of ODS testing laboratories and establishment of relevant standards and specifications. MEE will establish 6 testing laboratories by the end of 2019 and selected China National Environmental Monitoring Centre, National Research Center for Environmental Analysis and Measurement, Guangdong Environmental Monitoring Center, Shandong Provincial Environment Monitoring Center, Zhejiang Environmental Monitoring Center, Ecological and Environmental Monitoring Center of Chongqing as the 6 laboratories. The laboratories will be equipped with pre-processing and testing facilities and will get certified after construction is completed. Their testing objects are currently considered to be foam products and blowing agents. The detection range of ODS products will be expanded gradually along with the need of the enforcement. In 2020, all the six new laboratories will be put into use to provide judgment basis for enforcement. Meanwhile, MEE will research and develop standards and specifications of ODS testing. Laboratory testing standard and specifications for ODS in industrial products will be formulated and get certified by the end of 2019; on-site rapid testing standard and specifications for ODS in industrial products will be formulated and get certified by the end of 2020. In addition, detection equipment will be provided to local EEBs to improve its enforcement capacities.

MEE will incorporate ODS and HFCs into its monitoring and measuring network of environmental quality to obtain, analyze and evaluate background situation and changing trends of ODS and HFCs, which will provide measuring data and technical support for management and monitoring. MEE will work with China Meteorological Administration and other organizations to jointly develop and share measuring network. Based on the principal of regional representation, minimum mesoscale meteorological cycle, long-term stability and with established necessary infrastructure, establishment of measuring stations will be carried out gradually and comprehensively based on the construction of pilot stations. China will conduct planning and study on the construction of ODS atmospheric measuring network, develop a construction programme based on the results, establish a long-term ODS measuring network step by step (including atmospheric ODS measuring stations in key cities and atmospheric ODS background value measuring stations), with the aims to strengthening the capacity of early alerting and evaluation. Specific construction schedule is as follows: starting from 2020, we will select several key cities to carry out ODS scientific research measuring, aiming for routine measuring within 2 to 3 years. The measuring data would be made available to the scientific research community. Planning and construction of atmospheric ODS background concentration measuring stations will be initiated in 2021.

Ministry of Science and Technology will provide more support for scientific research related to ODS and gradually incorporate it into key science and technology program. Meanwhile, line ministries will also provide more support on science and technology research related to ODS in their respective role.

## 5. Conclusion

The 82nd ExCom meeting deferred consideration of the funding request of the third tranche of the four sector plans of China's Stage II HPMP. However, based on careful review of the progress report and funding request of the four sector plans before the 82nd ExCom meeting, the MLF Secretariat believed conditions were met for approval of the next tranche according to the Agreement between ExCom and China and recommended approval of the third tranche of the four sector plans. Meanwhile, Stage II of the HPPMP is yet to be fully deliberated since first submitted to the 79th ExCom meeting. Although the bridging funds will serve to address immediate control measures, China is seriously concerned about the great risks for achieving

the 2020 target for HCFC phase-out caused by the deferred approval of annual tranches of the Stage II HPMP and HPPMP.

According to the 2017 A7 data, the total production and consumption of China are respectively 21,671 ODP tons and 14,605 ODP tons, accounting for 74% and 77% of the baseline. None of these sectors has reached the 2020 target. For the consumption sectors, the Agreement of the Stage II of HPMP stipulates that China needs to achieve the 37.6% phase-out of the baseline by 2020. However, the issued quota for domestic use in 2019 is 15,037 ODP tons, and China needs to phase out about 3,265 ODP tons or about 50,000 MT of HCFCs consumption in 2019. For the production sector, the HCFCs production issued in 2019 is 22,742 ODP tons. To achieve the 2020 phase-out target proposed in the Stage II HPPMP, the production sector should phase out 3,800 ODP tons or 76,700 MT in 2019. China is faced with undeniable challenges in achieving this substantial amount of HCFC phase-out without the timely approval and release of the annual tranches.

In addition, all the tranches approved and released under the Stage II HPMP have been committed. Some sectors such as XPS foam sector and solvent sector, have recruited additional enterprises awaiting for signing new conversion contract. Deferring approval of the tranches of the Stage II HPMP seriously affects the momentum of the HCFC phase-out in the sectors. Through this report, China has demonstrated that the monitoring, reporting, verification and enforcement systems have been established since China initialed its ODS phase-out activities, built up and improved overtime, and have been functioning effectively. This report also identifies areas where improvement can be undertaken, and action plans have been presented to strengthen MRV and enforcement, to assure the long-term sustainability of China's phase-out achievements. Considering the current situation, China would like to request that the ExCom approves the annual tranches for Stage II HPMP and Stage II HPPMP at the 83rd meeting to complement and build on China's demonstrated ODS management and enforcement efforts while preventing any potential compliance risk related to HCFC phase-out in 2020.

# Regulations on Administration of Ozone Depleting Substances

(Adopted at the 104th Executive Meeting of the State Council on March 24, 2010, promulgated by Decree No. 573 of the State Council of the People's Republic of China on April 8, 2010, and effective as of June 1, 2010)

## Chapter I General Provisions

**Article 1** These Regulations are formulated in accordance with the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution for the purpose of strengthening administration of ozone depleting substances, fulfilling the obligations specified in the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, protecting the ozone layer and the ecological environment, and safeguarding human health.

**Article 2** The term "ozone depleting substances" in these Regulations means the chemicals that damage the ozone layer and are included in the Catalogue of Controlled Ozone Depleting Substances in China.

The Catalogue of Controlled Ozone Depleting Substances in China shall be compiled, adjusted and published by the competent environmental protection department of the State Council in conjunction with the relevant departments of the State Council.

**Article 3** These Regulations apply to such activities as production, sale, use, import and export of ozone depleting substances within the territory of the People's Republic of China.

The term "production" in the preceding paragraph means the activities of manufacturing ozone depleting substances. The term "use" in the preceding paragraph means the production and business activities conducted by using ozone depleting substances, excluding the use of products that contain ozone depleting substances.

**Article 4** The competent environmental protection department of the State

Council shall be responsible for unified supervision and administration of ozone depleting substances throughout the country.

The competent commerce department of the State Council, the General Administration of Customs and other relevant departments shall, in accordance with the provisions of these Regulations and in compliance with their functions and duties, be responsible for relevant supervision and administration of ozone depleting substances.

The competent environmental protection departments, the competent commerce departments and other relevant departments of local people's governments at or above the county level shall, in accordance with the provisions of these Regulations and in compliance with their functions and duties, be responsible for relevant supervision and administration of ozone depleting substances within their respective administrative areas.

**Article 5** The State shall gradually reduce and finally phase out ozone depleting substances used as refrigerants, blowing agents, extinguishing agents, solvents, cleaning agents, process agents, pesticides, aerosols, expansion agents, etc.

The competent environmental protection department of the State Council shall, in conjunction with the relevant departments of the State Council, draft the China's Country Program for Ozone Depleting Substances Phase-out (hereinafter referred to as the Country Program) and submit the same to the State Council for approval before implementation.

**Article 6** The competent environmental protection department of the State Council shall, based on the Country Program and the progress in the phase-out of ozone depleting substances and in conjunction with the relevant departments of the State Council, decide on and make public the types of construction, alteration or expansion projects for producing or using ozone depleting substances, which are subject to restriction or prohibition, and shall compile and make public the catalogue of ozone depleting substances the production, use, import or export of which is subject to restriction or prohibition.

Where, for special purposes, there is a real need to produce or use ozone

depleting substances the production or use of which is subject to restriction or prohibition as specified in the preceding paragraph, the matter shall be subject to approval by the competent environmental protection department of the State Council in conjunction with the relevant departments of the State Council in accordance with the provisions of the Montreal Protocol on Substances that Deplete the Ozone Layer on permitting the use of ozone depleting substances for special purposes.

**Article 7** The State exercises control over the total amounts and quotas in respect of ozone depleting substances to be produced, used, imported and exported. Based on the Country Program and the progress in the phase-out of ozone depleting substances, the competent environmental protection department of the State Council shall, in consultation with the relevant departments of the State Council, decide on and make public the national total annual amounts of quotas for production, use, import and export of ozone depleting substances.

**Article 8** The State encourages and supports scientific research, technological development, and wide use of alternatives to ozone depleting substances and alternative technologies.

The competent environmental protection department of the State Council shall, in conjunction with the relevant departments of the State Council, compile, adjust and make public the Catalogue of Recommended Alternatives to Ozone Depleting Substances in China.

Development, production and use of alternatives to ozone depleting substances shall comply with industrial policies of the State and enjoy preferential policies in accordance with the relevant provisions of the State. The State shall reward the units and individuals that have made outstanding achievements in phasing out ozone depleting substances.

**Article 9** All units and individuals have the right to report violations of these Regulations to the competent environmental protection departments or other relevant departments of people's governments at or above the county level. The department receiving the report shall investigate and handle such a violation in a timely manner and maintain the confidentiality of the reporting person, and shall reward him if the

reported violation is ascertained through investigation.

## Chapter II Production, Sale and Use

**Article 10** A unit that is to produce or use ozone depleting substances shall, in accordance with the provisions of these Regulations, apply for a quota permit for the production or use. However, any of the following units that use ozone depleting substances is not required to apply for a quota permit for the use:

(1) maintenance shops that use ozone depleting substances for maintenance and repair of refrigeration equipment or a refrigeration system or fire extinguishing system;

(2) laboratories that use a small amount of ozone depleting substances for experimental analysis;

(3) entry-exit inspection and quarantine agencies that use ozone depleting substances for quarantine purposes to prevent the in- or out-flow of harmful organisms; or

(4) other units that are not required to apply for a quota permit for the use, as is specified by the competent environmental protection department of the State Council.

**Article 11** A unit that produces or uses ozone depleting substances shall meet the following requirements, apart from those specified by laws and administrative regulations:

(1) having a record of lawful production or use of the relevant ozone depleting substances;

(2) having the premises, facilities, equipment and professional technicians for production or use of the relevant ozone depleting substances;

(3) having the environmental protection facilities that pass the acceptance check by the competent environmental protection department; and

(4) having a sound management system for production and business operations.

The provisions of subparagraph (1) of the preceding paragraph shall not apply to units that use ozone depleting substances for special purposes specified in Article 6 of

these Regulations.

**Article 12** A unit that produces or uses ozone depleting substances shall, prior to October 31 of each year, apply in writing to the competent environmental protection department of the State Council for a production or use quota for the following year, and submit documentary evidence of its compliance with the requirements specified in Article 11 of these Regulations.

The competent environmental protection department of the State Council shall, based on the national total annual quotas for production and use of ozone depleting substances and the applicant's record of production or use of the relevant ozone depleting substances, determine the production or use quota to be allocated to the applicant for the following year and complete the examination of the application prior to December 20 of each year. The said department shall issue a quota permit for production or use for the following year to an applicant that complies with the requirements, which shall be announced and copies of which shall be sent to the relevant departments of the State Council and to the competent environmental protection department of the people's government of the province, autonomous region or municipality directly under the Central Government where the applicant is located; if an applicant fails to comply with the requirements, the said department shall inform the applicant of the fact and the reasons in writing.

**Article 13** A quota permit for production or use of ozone depleting substances shall specify the following particulars:

(1) name, address, and legal representative or responsible person of the unit that produces or uses ozone depleting substances;

(2) type, purpose and amount of ozone depleting substances permitted to be produced or used;

(3) term of validity; and

(4) permit-issuing authority, date of issue and serial number of the permit.

**Article 14** Where a unit that produces or uses ozone depleting substances needs adjustment in its quota, it shall apply to the competent environmental protection department of the State Council for quota alteration.

The competent environmental protection department of the State Council shall examine the application in accordance with the requirements and on the basis specified in Articles 11 and 12 of these Regulations and complete the examination within 20 working days from the date of acceptance of the application. If the applicant complies with the requirements, the said department shall make adjustment to its quota and announce such adjustment; if the applicant fails to comply with the requirements, the said department shall inform the applicant of the fact and the reasons in writing.

**Article 15** A unit that produces ozone depleting substances shall not produce ozone depleting substances beyond the type, amount or term of validity specified in its quota permit for the production, and shall not produce or sell ozone depleting substances beyond the purpose specified in the said permit.

Producing ozone depleting substances without a quota permit for the production is prohibited.

**Article 16** A unit that has obtained a quota permit for use in accordance with the provisions of these Regulations shall not use ozone depleting substances beyond the type, purpose, amount or term of validity specified in the said permit.

Using ozone depleting substances without a quota permit for the use is prohibited, with the exception of the units that are not required to apply for a quota permit for use, as specified in Article 10 of these Regulations.

**Article 17** A unit that sells ozone depleting substances shall go through the formalities for the record as prescribed by the competent environmental protection department of the State Council.

The competent environmental protection department of the State Council shall announce the name list of the units that have been kept on record for selling ozone depleting substances.

**Article 18** Purchasing and selling of ozone depleting substances shall only be conducted between the units that meet the requirements of these Regulations for producing, selling or using ozone depleting substances, with the exception of import and export of ozone depleting substances in accordance with the provisions of these

Regulations.

**Article 19** A unit engaged in such business activities as maintenance, repair or scrapping treatment of refrigeration equipment or a refrigeration system or fire extinguishing system that contains ozone depleting substances shall apply for the record with the competent environmental protection department of the people's government at the county level of the place where it is located.

A unit specially engaged in such business activities as recovery, reclamation or destruction of ozone depleting substances shall apply for the record with the competent environmental protection department of the people's government of the province, autonomous region or municipality directly under the Central Government where it is located.

**Article 20** A unit that produces or uses ozone depleting substances shall take the necessary measures to prevent or reduce the leakage and discharge of ozone depleting substances as prescribed by the competent environmental protection department of the State Council.

A unit engaged in such business activities as maintenance, repair or scrapping treatment of refrigeration equipment or a refrigeration system or fire extinguishing system that contains ozone depleting substances shall, as prescribed by the competent environmental protection department of the State Council, recover or recycle ozone depleting substances or hand them over to a unit engaged in such business activities as recovery, reclamation or destruction of ozone depleting substances for environmentally sound disposal.

A unit engaged in such business activities as recovery, reclamation or destruction of ozone depleting substances shall carry out environmentally sound disposal of ozone depleting substances as prescribed by the competent environmental protection department of the State Council and shall not discharge them directly.

**Article 21** A unit engaged in such business activities as production, sale, use, recovery, reclamation or destruction of ozone depleting substances, or maintenance, repair or scrapping treatment of refrigeration equipment or a refrigeration system or fire extinguishing system that contains ozone depleting substances shall keep intact

the original materials about its production and business activities for at least three years and submit the relevant data as prescribed by the competent environmental protection department of the State Council.

## Chapter III Import and Export

**Article 22** The State exercises control over import and export of ozone depleting substances and carry out catalogue management. The competent environmental protection department of the State Council shall, in conjunction with the competent commerce department of the State Council and the General Administration of Customs, formulate, adjust and make public the Catalogue of Ozone Depleting Substances Under Import and Export Control in China.

A unit that imports or exports ozone depleting substances included in the Catalogue of Ozone Depleting Substances Under Import and Export Control in China shall, in accordance with the provisions of these Regulations, apply to the national authority in charge of import and export of ozone depleting substances for quotas and the approval certificate for import or export of ozone depleting substances, and submit the materials about the type, amount, source and purpose of ozone depleting substances to be imported or exported.

**Article 23** The national authority in charge of import and export of ozone depleting substances shall complete the examination of an application within 20 working days from the date of acceptance of the application and make a decision to approve or not to approve the application. If it decides to approve the application, it shall issue to the applicant an approval certificate for import or export; if it decides not to approve the application, it shall inform the applicant of the fact and the reasons in writing.

An approval certificate for import or export shall be valid for a term of not longer than 90 days, and shall not be used after the expiry date or carried over to the following year.

**Article 24** A unit that has obtained an approval certificate for import or

export of ozone depleting substances shall, as prescribed by the competent commerce department of the State Council, apply for an import or export license and go through customs clearance formalities on the basis of the license. Ozone depleting substances included in the Catalogue of Entry-Exit Goods Under Inspection and Quarantine by Entry-Exit Inspection and Quarantine Agencies shall be subject to inspection conducted by the entry-exit inspection and quarantine agency in accordance with law.

Where ozone depleting substances are to be brought in from abroad to special customs surveillance zones or bonded facilities under surveillance within the territory of the People's Republic of China or vice versa, the import and export unit shall, in accordance with the provisions of these Regulations, apply for an approval certificate for import or export and an import or export license; where ozone depleting substances are to be brought in to special customs surveillance zones or bonded facilities under surveillance within the territory of the People's Republic of China from other places within the Chinese territory or vice versa, or move between the said zones and facilities, an approval certificate for import or export and an import or export license are not required.

## Chapter IV Supervision and Inspection

**Article 25** The competent environmental protection departments and other relevant departments of people's governments at or above the county level shall, in accordance with the provisions of these Regulations and in compliance with their functions and duties, supervise and inspect such activities as production, sale, use, import and export of ozone depleting substances.

**Article 26** When conducting supervision and inspection, the competent environmental protection departments and other relevant departments of people's governments at or above the county level have the power to take the following measures:

(1) to require the unit under inspection to provide relevant materials;

(2) to require the unit under inspection to give an account of its implementation

of these Regulations;

(3) to enter the production, operation and storage premises of the unit under inspection to conduct investigation and collect evidence;

(4) to order the unit under inspection to cease and desist from violating these Regulations and fulfill its statutory obligations; and

(5) to impound or seal up ozone depleting substances that are illegally produced, sold, used, imported or exported, as well as the production equipment, facilities, raw materials and products.

The unit under inspection shall render cooperation, give truthful information and provide the necessary materials, and shall not reject or obstruct the inspection.

**Article 27** When conducting supervision and inspection, the competent environmental protection departments and other relevant departments of people's governments at or above the county level shall send not less than two inspectors, who shall show their valid law enforcement credentials.

Staff members of the competent environmental protection departments and other relevant departments of people's governments at or above the county level are obligated to keep confidential the commercial secrets that they come to know in the course of supervision and inspection.

**Article 28** The competent environmental protection department of the State Council shall establish a sound management system for data and information concerning ozone depleting substances, in order to collect, pool and make public the data and information about production, use, import and export of ozone depleting substances.

The competent environmental protection departments of local people's governments at or above the county level shall report on violations of these Regulations discovered in the course of supervision and inspection and their handling of the same, level by level, up to the competent environmental protection department of the State Council.

Other relevant departments of local people's governments at or above the county level shall report on violations of these Regulations discovered in the course of

supervision and inspection and their handling of the same, level by level, up to the relevant departments of the State Council, which shall send a copy of the reports to the competent environmental protection department of the State Council in a timely manner.

**Article 29** Where the competent environmental protection department or any other relevant department of a local people's government at or above the county level fails to investigate and handle a violation of these Regulations, the competent department at a higher level has the power to order the former department to investigate and handle the violation in accordance with law, or directly investigate and handle the violation itself.

## Chapter V Legal Liability

**Article 30** Where a department responsible for supervision and administration of ozone depleting substances or a staff member thereof commits one of the following acts, the person in charge with competent accountability and other persons with competent accountability shall be given a sanction in accordance with law, and if their acts constitute crimes, they shall be investigated for criminal liability in accordance with law:

(1) issuing a quota permit for production or use of ozone depleting substances in violation of the provisions of these Regulations;

(2) issuing an approval certificate or license for import or export of ozone depleting substances in violation of the provisions of these Regulations;

(3) failing to investigate and handle discovered violations of these Regulations in accordance with law;

(4) extorting or accepting money or things of value from another person or seeking other benefits when handling procedures for granting administrative licensing for production, use, import or export of ozone depleting substances or when conducting supervision and inspection; or

(5) otherwise committing illegalities for personal gain, abusing its/his power or

neglecting its/his duty.

**Article 31** Where a unit produces ozone depleting substances without a quota permit for the production, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to cease and desist from such illegal production, confiscate the raw materials used therefor, ozone depleting substances illegally produced and the illegal income thereof, dismantle and destroy the equipment and facilities for illegal production, and concurrently impose on it a fine of 1,000,000 yuan.

**Article 32** Where a unit that is required to apply for a quota permit for use in accordance with the provisions of these Regulations uses ozone depleting substances without such a permit, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to cease and desist from such illegal use, confiscate ozone depleting substances in illegal use, the products resulting from such illegal use and the illegal income thereof, and concurrently impose on it a fine of 200,000 yuan; if the circumstances are serious, a fine of 500,000 yuan shall be imposed concurrently and the equipment and facilities for illegal use shall be dismantled or destroyed.

**Article 33** Where a unit that produces or uses ozone depleting substances commits one of the following acts, the competent environmental protection department of the people's government of the province, autonomous region or municipality directly under the Central Government where it is located shall order it to cease and desist from such illegal act, confiscate ozone depleting substances illegally produced or in illegal use, the products resulting from such illegal use and the illegal income thereof, concurrently impose on it a fine of not less than 20,000 yuan but not more than 100,000 yuan, and report the matter to the competent environmental protection department of the State Council, which shall reduce the unit's production or use quota; if the circumstances are serious, a fine of not less than 100,000 yuan but not more than 200,000 yuan shall be imposed concurrently and the matter shall be reported to the competent environmental protection department of the State Council, which shall revoke the unit's quota permit for the production or use:

(1) producing ozone depleting substances beyond the type, amount or term of validity specified in its quota permit for the production;

(2) producing or selling ozone depleting substances beyond the purpose specified in its quota permit for the production; or

(3) using ozone depleting substances beyond the type, amount, purpose or term of validity specified in its quota permit for the use.

**Article 34** Where a unit that produces, sells or uses ozone depleting substances sells or purchases ozone depleting substances to or from a unit that does not comply with the requirements of these Regulations, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to make corrections, confiscate ozone depleting substances for illegal sale or illegally purchased and the illegal income thereof, and impose on it a fine three times the total market value of ozone depleting substances sold or purchased; in the case of a unit that has obtained a quota permit for the production or use, the matter shall be reported to the competent environmental protection department of the State Council, which shall reduce its production or use quota.

**Article 35** Where a unit that produces or uses ozone depleting substances fails to take the necessary measures to prevent or reduce the leakage or discharge of ozone depleting substances as required, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to make corrections within a specified time limit and impose on it a fine of 50,000 yuan; if the unit fails to make corrections within the specified time limit, a fine of 100,000 yuan shall be imposed, and the matter shall be reported to the competent environmental protection department of the State Council, which shall reduce its production or use quota.

**Article 36** Where a unit engaged in such business activities as maintenance, repair or scrapping treatment of refrigeration equipment or a refrigeration system or fire extinguishing system that contains ozone depleting substances fails to recover or recycle ozone depleting substances or hand them over to a unit engaged in such

business activities as recovery, reclamation or destruction of ozone depleting substances for environmentally sound disposal as required, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to make corrections and impose on it a fine three times the costs of environmentally sound disposal.

**Article 37** Where a unit engaged in such business activities as recovery, reclamation or destruction of ozone depleting substances fails to conduct environmentally sound disposal of ozone depleting substances as required but discharges them directly into the air, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to make corrections and impose on it a fine three times the costs of environmentally sound disposal.

**Article 38** Where a unit engaged in such business activities as production, sale, use, import, export, recovery, reclamation or destruction of ozone depleting substances, or maintenance, repair or scrapping treatment of refrigeration equipment or a refrigeration system or fire extinguishing system that contains ozone depleting substances, commits one of the following acts, the competent environmental protection department of the local people's government at or above the county level of the place where it is located shall order it to make corrections and impose on it a fine of not less than 5,000 yuan but not more than 20,000 yuan:

(1) failing to apply for the record with the competent environmental protection department as required by these Regulations;

(2) failing to keep intact the original materials about its production and business activities as required;

(3) failing to submit in time the data about its business activities, or making a false report or concealing the facts thereon; or

(4) failing to provide the necessary materials as required by supervisors and inspectors.

**Article 39** Where a unit rejects or obstructs supervision and inspection conducted by the competent environmental protection department or other relevant

departments, or practices fraud when under supervision and inspection, the supervision and inspection department shall order it to make corrections and impose on it a fine of not less than 10,000 yuan but not more than 20,000 yuan; if such act constitutes a violation against public security administration, the public security organ shall impose a public security administration penalty in accordance with law; if such act constitutes a crime, criminal liability shall be investigated for in accordance with law.

**Article 40** Where an import or export unit imports or exports ozone depleting substances without an import or export license or does so beyond the requirements specified in the import or export license, the customs shall impose on it a penalty in accordance with the provisions of the relevant laws and administrative regulations; if a crime is constituted, criminal liability shall be investigated for in accordance with law.

## Chapter VI Supplementary Provision

**Article 41** These Regulations shall be effective as of June 1, 2010.

**Annex X**

**UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF CHINA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS**

1. This Agreement represents the understanding of the Government of China (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 16,978.9 ODP tonnes by 1 January 2015 in compliance with Montreal Protocol schedules.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 ("Maximum allowable total consumption of Annex C, Group I substances") of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3, 4.2.3, 4.3.3, 4.4.3. 4.5.3, and 4.6.3 (remaining eligible consumption).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A ("The Targets, and Funding") to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

4. The Country agrees to implement this Agreement in accordance with the HCFC phase-out sector plans submitted and the commitments specified in Appendix 8-A. In accordance with sub-paragraphs 5(a)(ii) and 5(b)(i) of this Agreement, the Country will accept independent verification of completion of the conversion of manufacturing capacity as well as achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement.

5. The Executive Committee will not provide the Funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions at least eight weeks[1] in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) For the release of any tranche:

(i) That the Country had met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which no obligation for reporting of country programme data exists at the date of the Executive Committee meeting at which the funding request is being presented are exempted;

(ii) That the meeting of these Targets has been independently verified, unless the Executive Committee decided that such verification would not be required; and

(iii) That, for all submissions from the 68th Meeting onwards, confirmation has been

[1] Tranches with requested level of funding of more than US $5 million should be submitted in full 12 weeks in advance to the applicable Executive Committee meeting in line with decision 20/7.

received from the Government that an enforceable national system of licensing and quotas for HCFC imports and, where applicable, production and exports is in place and that the system is capable of ensuring the Country's compliance with the Montreal Protocol HCFC phase-out schedule for the duration of this Agreement;

(b) Conditions to be met as a precondition for the release of tranches for a sector plan:

(i) For sector plans with activities that include the conversion of manufacturing capacity, the Country has submitted a verification report of a random sample of at least 5 per cent of the manufacturing lines which had completed their conversion in the year to be verified, on the understanding that the total aggregated HCFC consumption of the random sample of the manufacturing lines represents at least 10 per cent of the sector consumption phased out in that year;

(ii) That the Country had submitted annual implementation reports in the form of Appendix 4-A ("Format of Implementation Reports and Plans") covering each previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

(iii) That the Country has submitted an annual implementation plan for the respective sector in the form of Appendix 4-A ("Format of Implementation Reports and Plans") covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement, and will also establish and maintain a system to monitor the consumption in the different sectors, to ensure compliance with the sector consumption limits set out in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5 of Appendix 2-A. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous annual implementation plans in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification as described in paragraph 4 above.

7. The Executive Committee agrees that the Country may have the flexibility to reallocate the approved funds, or part of the funds, within the funding foreseen for each sector according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

(a) Should the Country decide during implementation of this Agreement to introduce alternative technologies other than those proposed in the sector plans submitted, or implement differently as proposed in those sector plans, this would require approval of those changes as part of an annual implementation plan. The documentation can also be provided as part of a revision to an existing annual implementation plan, to be submitted eight weeks prior to any meeting of the Executive Committee. Such a request would include a description of the changes in activities to implement the new alternative technology, the calculation of the associated incremental costs and the impact on the climate. The Country agrees that potential savings in incremental costs related to the change of technology would decrease the overall funding level under this Agreement accordingly;

(b) Reallocations categorized as major changes must be documented in advance in an Annual Implementation Plan and approved by the Executive Committee as described in sub-paragraph 5(b)(iii) above. The documentation can also be provided as part of a revision to an existing annual implementation plan, to be submitted eight weeks prior to any meeting of the Executive Committee. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Modifications to any clause in this Agreement;

(iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches on a sector level;

(iv) Provision of funding for programmes or activities not included in the current endorsed annual implementation plan with a cost greater than 20 per cent of the total cost of the last approved tranche or US $2.5 million, whichever is lower; and

(v) Removal of activities in the annual implementation plan with a cost greater than 20 per cent of the total cost of the last approved tranche or US $2.5 million, whichever is lower;

(c) Reallocations not categorized as major changes may be incorporated in the approved annual implementation plan, under implementation at the time, and reported to the Executive Committee in the subsequent annual implementation report; and

(d) Any remaining funds will be returned to the Multilateral Fund upon completion of the last tranche of the Agreement.

8. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the "Lead IA"), and the Government of Germany, the Government of Japan, UNIDO, UNEP and the World Bank have agreed to be cooperating agencies ("Cooperating IAs) in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of any of the agencies taking part in this Agreement.

9. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement across all relevant sectors, including but not limited to independent verification as per sub-paragraph 5(b)(i), and implementing the activities related to the role as the Lead IA described in Appendix 6-A and the activities as a sector Lead IA described in Appendix 6-B. UNIDO and UNEP will be responsible for carrying out the activities in the respective Sector Plans described in Appendices 6-C and 6-F, respectively, and their subsequent revisions as per sub-paragraph 5(b)(iii) and paragraph 7. The World Bank will be responsible for carrying out the independent verification as per sub-paragraph 5(a)(ii), and implementing additional activities regarding its role as a sector Lead IA described in Appendix 6-E. The Governments of Germany and Japan as the "Cooperating IAs" will be responsible for carrying out the activities described in Appendices 6-D and 6-G. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IAs with the fees set out in rows 2.1.2, 2.2.2, 2.2.4, 2.3.2, 2.4.2, 2.5.2, 2.5.4, 2.6.2 and 2.7.2 of Appendix 2-A.

10. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once these decisions are taken, this specific case will not be an impediment for future tranches as per paragraph 5 above.

11. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the funding of any other consumption sector projects or any other related activities in the Country.

12. The Country will comply with any reasonable request of the Executive Committee, the Lead IA, the sector Lead IAs and the Cooperating IAs to facilitate implementation of this Agreement. In particular, it will provide the Lead IA, the sector Lead IAs and the Cooperating IAs with access to the information necessary to verify compliance with this Agreement.

13. The completion of stage I of the HPMP and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should there at that time still be activities that are outstanding, and which were foreseen in the Sector Plan, and its subsequent revisions as per sub-paragraph 5(b)(iii) and paragraph 7, the completion will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), (b), (d), (e) and (g) of Appendix 4-A will continue until the time of the completion unless otherwise specified by the Executive Committee.

14. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

15. This updated Agreement supersedes the Agreement reached between the Government of China and the Executive Committee at the 65th meeting and its revised Appendix 5-A approved at the 66th meeting of the Executive Committee.

**APPENDICES**

**APPENDIX 1-A: THE SUBSTANCES**

| Substance | Annex | Group | Starting point for aggregate reductions in consumption (ODP tonnes) |
|---|---|---|---|
| HCFC-22 | C | I | 11,495.31 |
| HCFC-123 | C | I | 10.13 |
| HCFC-124 | C | I | 3.07 |
| HCFC-141b | C | I | 5,885.18 |
| HCFC-142b | C | I | 1,470.53 |
| HCFC-225 | C | I | 1.22 |
| Total | | | 18,865.44 |

## APPENDIX 2-A: THE TARGETS, AND FUNDING

| | | 2011 | 2012 | 2013 | 2014 | 2015 | Total |
|---|---|---|---|---|---|---|---|
| Consumption targets | | | | | | | |
| 1.1 | Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes) | n/a | n/a | 19,269.0 | 19,269.0 | 17,342.1 | n/a |
| 1.2 | Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes) | n/a | n/a | 18,865.4 | 18,865.4 | 16,978.9 | n/a |
| 1.3.1 | Maximum allowable consumption of Annex C, Group I substances in the ICR sector (ODP tonnes) | n/a | n/a | 2,402.8 | 2,402.8 | 2,162.5 | n/a |
| 1.3.2 | Maximum allowable consumption of Annex C, Group I substances in the XPS foam sector (ODP tonnes) | n/a | n/a | 2,540.0 | 2,540.0 | 2,286.0 | n/a |
| 1.3.3 | Maximum allowable consumption of Annex C, Group I substances in the PU foam sector (ODP tonnes) | n/a | n/a | 5,392.2 | 5,392.2 | 4,449.6 | n/a |
| 1.3.4 | Maximum allowable consumption of Annex C, Group I substances in the RAC sector (ODP tonnes) | n/a | n/a | 4,108.5 | 4,108.5 | 3,697.7 | n/a |
| 1.3.5 | Maximum allowable consumption of Annex C, Group I substances in the solvent sector | n/a | n/a | 494.2 | 494.2 | 455.2 | n/a |
| Funding industrial and commercial refrigeration and air conditioning (ICR) sector plan | | | | | | | |
| 2.1.1 | Sector Lead IA (UNDP) agreed funding (US $) | 25,380,000 | 6,900,000 | 8,495,000 | 11,075,000 | 9,150,000 | 61,000,000 |
| 2.1.2 | Support costs for UNDP (US $) | 1,903,500 | 483,000 | 594,650 | 775,250 | 640,500 | 4,396,900 |
| Funding extruded polystyrene (XPS) foam sector plan | | | | | | | |
| 2.2.1 | Sector Lead IA (UNIDO) agreed funding (US $) | 21,372,000 | 10,217,000 | 3,998,000 | 6,330,000 | 6,733,000 | 48,650,000 |
| 2.2.2 | Support costs for UNIDO (US $) | 1,602,900 | 715,190 | 279,860 | 443,100 | 471,310 | 3,512,360 |
| 2.2.3 | Sector cooperating agency (Germany) agreed funding (US $) | 459,023 | 390,977 | - | - | 500,000 | 1,350,000 |
| 2.2.4 | Support costs for Germany (US $) | 51,260 | 47,059 | - | - | 60,181 | 158,500 |
| Funding polyurethane rigid (PU) foam sector plan | | | | | | | |
| 2.3.1 | Sector Lead IA (World Bank) agreed funding (US $) | 38,859,000 | 5,520,000 | 13,592,000 | 4,079,000 | 10,950,000 | 73,000,000 |
| 2.3.2 | Support costs for World Bank (US $) | 2,914,000 | 386,400 | 951,440 | 285,530 | 766,500 | 5,303,870 |
| Funding room air conditioning (RAC) sector plan | | | | | | | |
| 2.4.1 | Sector Lead IA (UNIDO) agreed funding (US $) | 36,430,000 | 9,200,000 | 8,495,000 | 9,625,000 | 11,250,000 | 75,000,000 |
| 2.4.2 | Support costs for UNIDO (US $) | 2,732,250 | 644,000 | 594,650 | 673,750 | 787,500 | 5,432,150 |
| Funding service sector plan, including enabling programme | | | | | | | |
| 2.5.1 | Sector Lead IA (UNEP) agreed funding (US $) | 1,579,000 | 598,000 | 1,104,000 | 1,173,000 | 786,000 | 5,240,000 |
| 2.5.2 | Support costs for UNEP (US $) | 176,703 | 66,921 | 123,547 | 131,269 | 87,960 | 586,400 |
| 2.5.3 | Sector cooperating agency (Japan) agreed funding (US $) | 80,000 | 80,000 | 80,000 | 80,000 | 80,000 | 400,000 |
| 2.5.4 | Support costs for Japan (US $) | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 52,000 |
| Funding national co-ordination | | | | | | | |
| 2.6.1 | Overall Lead IA (UNDP) agreed funding (US $) | 360,000 | - | - | - | - | 360,000 |
| 2.6.2 | Support costs for UNDP (US $) | 27,000 | - | - | - | - | 27,000 |
| Funding solvent sector plan | | | | | | | |
| 2.7.1 | Overall Lead IA (UNDP) agreed funding (US $) | 2,500,000 | 0 | 2,000,000 | 0 | 500,000 | 5,000,000 |
| 2.7.2 | Support costs for UNDP (US $) | 187,500 | 0 | 140,000 | 0 | 35,000 | 362,500 |
| Overall funding | | | | | | | |
| 3.1 | Total agreed funding (US $) | 127,019,023 | 32,905,977 | 37,764,000 | 32,362,000 | 39,949,000 | 270,000,000 |
| 3.2 | Total support cost (US $) | 9,605,513 | 2,352,970 | 2,694,547 | 2,319,299 | 2,859,351 | 19,831,680 |
| 3.3 | Total agreed costs (US $) | 136,624,536 | 35,258,947 | 40,458,547 | 34,681,299 | 42,808,351 | 289,831,680 |

## APPENDIX 2-A: THE TARGETS, AND FUNDING - continuation

| Phase-out and remaining eligible consumption | | |
|---|---|---|
| 4.1.1 | Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes) | 1,443.73 |
| 4.1.2 | Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)* | 35.99 |
| 4.1.3 | Remaining eligible consumption for HCFC-22 (ODP tonnes) | 10,015.59 |
| 4.2.1 | Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes) | 0.00 |
| 4.2.2 | Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes) | 0.00 |
| 4.2.3 | Remaining eligible consumption for HCFC-123 (ODP tonnes) | 10.13 |
| 4.3.1 | Total phase-out of HCFC-124 agreed to be achieved under this Agreement (ODP tonnes) | 0.00 |
| 4.3.2 | Phase-out of HCFC-124 to be achieved in previously approved projects (ODP tonnes) | 0.00 |
| 4.3.3 | Remaining eligible consumption for HCFC-124 (ODP tonnes) | 3.07 |
| 4.4.1 | Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes) | 1,681.29 |
| 4.4.2 | Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)** | 16.71 |
| 4.4.3 | Remaining eligible consumption for HCFC-141b (ODP tonnes) | 4,187.18 |
| 4.5.1 | Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes) | 260.81 |
| 4.5.2 | Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes)*** | 6.66 |
| 4.5.3 | Remaining eligible consumption for HCFC-142b (ODP tonnes) | 1,203.06 |
| 4.6.1 | Total phase-out of HCFC-225 agreed to be achieved under this Agreement (ODP tonnes) | 0.00 |
| 4.6.2 | Phase-out of HCFC-225 to be achieved in previously approved projects (ODP tonnes) | 0.00 |
| 4.6.3 | Remaining eligible consumption for HCFC-225 (ODP tonnes) | 1.22 |

* Associated with previously approved funding not included in row 3 of US $ 12,081,951, including a compressor manufacturing conversion project and 50 per cent of the funding for an XPS project with consumption in HCFC-22 and HCFC-142b

** Associated with previously approved funding not included in row 3 of US $ 2,753,079

*** Associated with previously approved funding not included in row 3 of US $ 986,650, including 50 per cent of the funding for an XPS project with consumption in HCFC-22 and HCFC-142b

## APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. The Funding Approval Schedule consists of several tranches. Under this Agreement, a tranche is defined as the funding set out in each year for each sector plan or the national co-ordination, respectively, as specified in Appendix 2-A.

2. Funding for the future tranches will be considered for approval at the last meeting of the year specified in Appendix 2-A.

**APPENDIX 4-A: FORMAT OF IMPLEMENTATION REPORTS AND PLANS**

1. The Lead IA, on behalf of the Country, will submit at least eight weeks[2] prior to the third meeting of the Executive Committee in any given year, for consideration at that meeting, the following reports to the Multilateral Fund Secretariat:

(a) A verification report of the consumption of each of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(a)(ii) of the Agreement. If not otherwise decided by the Executive Committee, such a verification has to be provided together with each tranche request and will include verification of the consumption for all relevant years as specified in sub-paragraph 5(a)(i) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(b) For each sector plan a narrative report, with data provided by calendar year, regarding the progress since the year prior to the previous report, reflecting, for each sector, the situation of the Country in regard to phase-out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include ODS phase-out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Annual Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes. The narrative report will cover all relevant years specified in sub-paragraph 5(a)(i) of the Agreement and can in addition also include information on activities in the current year;

(c) For each sector plan, a written description of the activities to be undertaken until and including the year of the planned submission of the next tranche request as per sub-paragraph 5(b)(iii). The description should highlight the interdependence of the activities, and take into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall plan and progress achieved, as well as any possible changes to the overall plan that are foreseen. The description should further specify and explain in detail such changes to the overall sector plan. This description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;

(d) For each sector plan with activities that include the conversion of manufacturing capacity, a verification report related to completed conversion as per sub-paragraph 5(b)(i) of the Agreement;

(e) For each sector, quantitative information for all annual implementation reports and annual implementation plans, submitted through an online database. This quantitative information, to be submitted by calendar year with each tranche request, will be amending the narratives and description for the report (see sub-paragraph 1(b) and (c)

[2] Tranches with requested level of funding of more than US $5 million should be submitted in full 12 weeks in advance to the applicable Executive Committee meeting in line with decision 20/7.

above), the annual implementation plan and any changes to the overall plan, and will cover the same time periods and activities; and

(f) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(e).

**APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES**

1. The Foreign Economic Cooperation Office/Ministry of Environment (FECO/MEP) is responsible for the overall co-ordination of activities to be undertaken in the HPMP with assistance of the Lead IA and acts as the National Ozone Unit, responsible for carrying out national policies and legislations regarding the control of ODS.

2. The national consumption will be monitored and determined based on production data and official import and export data for the Substances recorded by relevant government departments in line with paragraph 5(a)(ii) of this Agreement.

3. In addition to the a national system of licensing and quotas for HCFC imports, production and exports referred to in paragraph 5(a)(iii), a quota system covering enterprises using large quantities of HCFC in the different consumption sectors, where applicable, will be established to control the consumption growth, achieve the consumption reduction in those enterprises and collect the consumption data.

4. For those sectors with large amounts of small and medium enterprises, like PU foam sector, solvent sector, XPS foam sector and ICR sector, the consumption would be managed by limiting the quantities of the relevant substances to be sold to the domestic market.

5. FECO/MEP will closely supervise those enterprises carrying out the conversion activities in stage I of the HPMP to ensure the phase-out target in those enterprises had been achieved.

6. FECO/MEP will co-ordinate with the Lead IA and Cooperating IAs to facilitate the verification of the targets set in the Agreement.

7. FECO/MEP will cooperate with the Lead IA and Cooperating IAs in the preparation of reports according to paragraph 5(b)(ii) and Appendix 4-A of this Agreement.

**APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY**

1. The Lead IA for stage I of the HPMP is UNDP. It will be responsible for a range of activities, including at least the following:

(a) Activities related to national co-ordination;

(b) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country’s HPMP;

(c) Assisting the Country in preparation of the Implementation Plans and subsequent reports as per Appendix 4-A;

(d) Providing independent verification to the Executive Committee that the Targets have been met (except for overall consumption targets specified in row 1.2 of Appendix 2-A)

and associated annual activities have been completed as indicated in the Implementation Plan consistent with Appendix 4-A. This independent verification can consist of a compilation of sector-specific independent verification carried out by the respective sector Lead IAs;

(e) Ensuring that the experiences and progress is reflected in updates of the overall sector plan and in future annual implementation plans consistent with Appendix 4-A;

(f) Fulfilling the reporting requirements for the annual implementation reports, annual implementation plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee;

(g) Ensuring that appropriate independent technical experts carry out the technical reviews;

(h) Carrying out required supervision missions;

(i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Implementation Plan and accurate data reporting;

(j) Ensuring that disbursements made to the Country are based on the use of the indicators; and

(k) Providing assistance with policy, management and technical support when required.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results as per sub-paragraph 5(b)(i) of the Agreement and sub-paragraph 1(d) of Appendix 4-A. The Lead IA can delegate the task described in this paragraph to the respective sector Lead IA on the understanding that such delegation will not interfere with the Lead IA's responsibility to carry out the verification of the HPMP results.

**APPENDIX 6-B: ROLE OF UNDP**

1. UNDP, as the sector Lead IA for the industrial and commercial refrigeration (ICR) sector and the solvent sector, will be responsible for a range of activities described in those sector plans, including at least the following:

(a) Providing assistance for policy development, planning and management of sector programming as set out in these sectors, when required;

(b) Ensuring verification of performance and progress of disbursement in accordance with this Agreement and with its specific internal procedures and requirements as set out in these sectors and assisting the Country in the implementation and assessment of the activities;

(c) Assisting the Country in the preparation of the ICR sector annual Implementation Plans as per Appendix 4-A;

(d) Preparing reports to the Lead IA on these activities as per Appendix 4-A; and

(e) Ensuring financial verification of the activities implemented.

2. UNDP will also act as sector Lead IA for any sector related obligations arising from any HCFC consumption sectors not specifically mentioned in this Agreement, with responsibilities closely resembling those under paragraph 1 above.

**APPENDIX 6-C: ROLE OF UNIDO**

1. UNIDO, as the Lead IA for the refrigeration and air conditioning (RAC) sector as well as for the extruded polystyrene (XPS) foam sector, will be responsible for a range of activities described in those sector plans, including at least the following:

(a) Providing assistance for policy development, planning and management of sector programming as set out in the RAC and XPS foam sector plans, when required;

(b) Ensuring verification of performance in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's RAC and XPS foam sector plans and assisting the Country in the implementation and assessment of the activities;

(c) Ensuring progress of disbursement in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's RAC and XPS foam sector plans;

(d) Assisting the Country in the preparation of respective RAC and XPS foam sector annual implementation plans as per Appendix 4-A;

(e) Providing reports to the Lead IA on these activities as per Appendix 4-A; and

(f) Ensuring financial verification of the activities implemented.

**APPENDIX 6-D: ROLE OF THE GOVERNMENT OF GERMANY**

1. The Government of Germany, as a Cooperating IA for the XPS foam sector, will be responsible for a range of activities described in that sector plan, including at least the following:

(a) Providing assistance for policy development, planning and management of sector programming as set out in the XPS foam sector plan, when required;

(b) Assisting the Country in the implementation and assessment of the activities;

(c) Providing reports to the sector Lead IA on these activities as per Appendix 4-A; and

(d) Ensuring financial verification of the activities implemented.

**APPENDIX 6-E: ROLE OF THE WORLD BANK**

1. After consultation with the Country and taking into account any views expressed, the World Bank will select and mandate an independent entity to carry out the verification of the consumption of the Country as specified in row 1.2 of Appendix 2-A, as per sub-paragraph 5(a)(ii) of this Agreement and sub-paragraph 1(a)(i) of Appendix 4-A.

2. The World Bank, as the sector Lead IA for the polyurethane foam (PU) sector, will be responsible for a range of activities described in that sector plan, including at least the following:

(a) Providing assistance for policy development, planning and management of sector programming as set out in the PU sector plan, when required;

(b) Ensuring verification of performance and progress of disbursement in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's PU sector plan and assisting the Country in the implementation and assessment of the activities;

(c) Assisting the Country in the preparation of PU sector annual implementation plans as per Appendix 4-A;

(d) Providing reports to the Lead IA on these activities as per Appendix 4-A; and

(e) Ensuring financial verification of the activities implemented.

**APPENDIX 6-F: ROLE OF UNEP**

1. UNEP, as the sector Lead IA for the refrigeration servicing sector, will be responsible for a range of activities described in that sector plan, including at least the following:

(a) Providing policy development assistance when required;

(b) Assisting the Country in the implementation and assessment of the activities under its responsibility and refer to the Lead IA of the HPMP to ensure a co-ordinated sequence in the activities;

(c) Assisting the Country in the preparation of service sector annual implementation plans as per Appendix 4-A;

(d) Providing reports to the Lead IA on these activities as per Appendix 4-A; and

(e) Ensuring financial verification of the activities implemented.

**APPENDIX 6-G: ROLE OF THE GOVERNMENT OF JAPAN**

1. The Government of Japan, as a Cooperating IA for the refrigeration servicing sector, will be responsible for a range of activities described in that sector plan, including at least the following:

(a) Providing policy development assistance when required;

(b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IA, and refer to the sector Lead IA to ensure a co-ordinated sequence in the activities;

(c) Providing reports to the sector Lead IA on these activities as per Appendix 4-A; and

(d) Ensuring financial verification of the activities implemented.

## APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 10 of the Agreement, the amount of funding provided may be reduced by US $160 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met.

## APPENDIX 8-A: COMMITMENTS UNDERTAKEN BY THE COUNTRY WITH RESPECT TO CONVERSION IN THE RAC SECTOR

1. During stage I of the HPMP, the Country agrees to convert at least 18 manufacturing lines for the production of RAC equipment to hydrocarbon technology as part of the RAC sector plan.

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**Annex XV**

# AGREEMENT BETWEEN THE GOVERNMENT OF CHINA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN

## Purpose

1. This Agreement represents the understanding of the Government of China (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 11,772 ODP tonnes by 1 January 2020 in compliance with Montreal Protocol schedule, including the total phase-out of HCFCs in the extruded polystyrene (XPS) foam, polyurethane (PU) foam, and solvent sectors by 2026, and noting that the national HCFC consumption target, as well as the targets for the industrial and commercial refrigeration and air conditioning (ICR) sector and the room air-conditioning manufacturing and heat pump water heaters (HPWH) (RAC) sector for the period 2021 to 2026 would be determined when stage III of the HCFC phase-out management plan (HPMP) is submitted.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3, 4.2.3, 4.3.3, 4.4.3, 4.5.3, and 4.6.3 (remaining consumption eligible for funding).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

4. The Country agrees to implement this Agreement in accordance with the stage II of the HPMP approved ("the Plan") and its sector plans. In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

## Conditions for funding release

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when the Country satisfies the following conditions at least twelve weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) That the Country has met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved;

(b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;

(c) That, for sector plans with activities that include the conversion of manufacturing capacity, the Country had submitted an independent verification report of a random sample of at least five per cent of the manufacturing lines which had completed their conversion in the year to be verified, on the understanding that the total aggregated HCFC consumption of the random sample of the manufacturing lines represents at least 10 per cent of the sector consumption phased out in that year;

(d) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A ("Format of Tranche Implementation Reports and Plans") covering each previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

(e) That the Country has submitted a Tranche Implementation Plan in the form of Appendix 4-A ("Format for Tranche Implementation Reports and Plans") covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

**Monitoring**

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement, and will also continue to maintain and operate a system to monitor the consumption in the different sectors to ensure compliance with the sector consumption limits set out in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4 and 1.3.5 of Appendix 2-A. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix. This monitoring will also be subject to independent verification as described in sub-paragraph 5(c) above.

**Flexibility in the reallocation of funds**

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved funds according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

(a) Reallocations categorized as major changes must be documented in advance either in a Tranche Implementation Plan as foreseen in sub-paragraph 5(e) above, or as a revision to an existing Tranche Implementation Plan to be submitted at least *twelve weeks* in advance to any meeting of the Executive Committee, for its approval. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Changes which would modify any clause of this Agreement;

(iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches;

(iv) Provision of funding for activities not included in the current approved Tranche Implementation Plan, or removal of an activity in the Tranche Implementation Plan, with a cost greater than 20 per cent of the total cost of the last approved tranche, or US $2.5 million, whichever is lower; and

(v) Changes in alternative technologies already selected, on the understanding that any submission for such a request would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable, as well as confirm that the Country agrees that potential savings related to the change of technology would decrease the overall funding level under this Agreement accordingly;

(b) Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;

(c) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan;

(d) The Country commits to examining the possibility of using pre-blended systems with low-global warming potential (GWP) blowing agents instead of blending them in-house, for those foam enterprises covered under the Plan, should this be technically viable, economically feasible and acceptable to the enterprises;

(e) The Country agrees, in cases where HFC technologies have been chosen as an alternative to HCFCs, and taking into account national circumstances related to health and safety: to monitor the availability of substitutes and alternatives that further minimize impacts on the climate; to consider, in the review of regulations, standards and incentives adequate provisions that encourage introduction of such alternatives; and to consider the potential for adoption of cost-effective alternatives that minimize the climate impact in the implementation of the HPMP, as appropriate, and inform the Executive Committee on the progress accordingly in tranche implementation reports; and

(f) Any remaining funds held by the bilateral or implementing agencies or the Country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

**Considerations for the refrigeration servicing sector**

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sector included in the Plan, in particular:

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and

(b) The Country and relevant bilateral and/or implementing agencies would take into consideration relevant decisions on the refrigeration servicing sector during the implementation of the Plan.

**Bilateral and implementing agencies**

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the “Lead IA”); UNDP, UNIDO,

United Nations Environment Programme (UN Environment) and the World Bank have agreed to be the sector lead implementing agencies ("Sector Lead IAs") under the overall lead of the Lead IA for ICR and solvent, XPS foam and RAC, service sector and enabling programme, and the PU foam sectors, respectively; and the Government of Germany, the Government of Italy, the Government of Japan have agreed to be cooperating implementing agencies (the "Cooperating IAs") under the lead of the Sector Lead and Lead IA in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA, Sector Lead IAs, and/or Cooperating IAs.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The roles of the Lead IA, Sector Lead IAs, and Cooperating IAs are contained in Appendix 6-A, Appendix 6-B and Appendix 6-D, respectively. The Executive Committee agrees, in principle, to provide the Lead IA, Sector Lead IAs, and the Cooperating IAs with the fees set out in rows 2.1.2, 2.2.2, 2.2.4, 2.3.2, 2.4.2, 2.4.4, 2.5.2, 2.5.4, 2.5.6, and 2.6.2 of Appendix 2-A.

**Non-compliance with the Agreement**

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 and, starting in 2019, rows 1.3.1, 1.3.2, 1.3.3, 1.3.4, or 1.3.5 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. The Country would not be double-penalized through both an aggregate and a sector-specific penalty. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A ("Reductions in Funding for Failure to Comply") in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once decisions are taken, the specific case of non-compliance with this Agreement will not be an impediment for the provision of funding for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decisions that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee, the Lead IA, Sector Lead IAs, and the Cooperating IAs to facilitate implementation of this Agreement. In particular, it will provide the Lead IA, Sector Lead IAs, and the Cooperating IAs with access to the information necessary to verify compliance with this Agreement.

**Date of completion**

14. The completion of the Plan and the associated Agreement will take place at the end of 2027. The completion of each sector plan will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified for the sector in Appendix 2-A. Should at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(e) and paragraph 7, the completion of the Plan or sector plan will be delayed until the end of the year following the implementation of the remaining activities upon approval by the Executive Committee. The reporting

requirements as per sub-paragraphs 1(a) to 1(f) of Appendix 4-A will continue until the time of the completion of the Plan unless otherwise specified by the Executive Committee.

**Validity**

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

16. This Agreement may be modified or terminated only by mutual written agreement of the Country and the Executive Committee of the Multilateral Fund.

**APPENDICES**

**APPENDIX 1-A: THE SUBSTANCES**

| Substance | Annex | Group | Starting point for aggregate reductions in consumption (ODP tonnes) |
|---|---|---|---|
| HCFC-22 | C | I | 11,495.31 |
| HCFC-123 | C | I | 10.13 |
| HCFC-124 | C | I | 3.07 |
| HCFC-141b | C | I | 5,885.18 |
| HCFC-142b | C | I | 1,470.53 |
| HCFC-225 | C | I | 1.22 |
| **Total** | **C** | **I** | **18,865.44** |

## APPENDIX 2-A: THE TARGETS, AND FUNDING

| Row | Particulars | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Consumption targets** | | | | | | | | | | | | | |
| 1.1 | Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes) | 17,342.1 | 17,342.1 | 17,342.1 | 17,342.1 | 12,524.9 | 12,524.9 | 12,524.9 | 12,524.9 | 12,524.9 | 6,262.4 | 6,262.4 | n/a |
| 1.2 | Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes) | 16,978.9 | 16,978.9 | 15,048.1 | 15,048.1 | 11,772.0 | * | * | * | * | * | * | n/a |
| 1.3.1 | Maximum allowable consumption of Annex C, Group I substances in the ICR sector (ODP tonnes) | 2,162.5 | 2,162.5 | 2,042.4 | 2,042.4 | 1,609.9 | 1,609.9 | ** | ** | ** | ** | ** | n/a |
| 1.3.2 | Maximum allowable consumption of Annex C, Group I substances in the XPS foam sector (ODP tonnes) | 2,286.0 | 2,286.0 | 2,032.0 | 2,032.0 | 1,397.0 | 1,397.0 | 1,397.0 | 762.0 | 762.0 | 165.0 | 0.0 | n/a |
| 1.3.3 | Maximum allowable consumption of Annex C, Group I substances in the PU foam sector (ODP tonnes) | 4,449.6 | 4,449.6 | 3,774.5 | 3,774.5 | 2,965.7 | 2,965.7 | 2,965.7 | 1,078.4 | 1,078.4 | 330.0 | 0.0 | n/a |
| 1.3.4 | Maximum allowable consumption of Annex C, Group I substances in the RAC sector (ODP tonnes) | 3,697.7 | 3,697.7 | 2,876.0 | 2,876.0 | 2,259.7 | 2,259.7 | *** | *** | *** | *** | *** | n/a |

| Row | Particulars | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.3.5 | Maximum allowable consumption of Annex C, Group I substances in the solvent sector | 455.2 | 455.2 | 395.4 | 395.4 | 321.2 | 321.2 | 321.2 | 148.3 | 148.3 | 55.0 | 0.0 | n/a |
| **Funding industrial and commercial refrigeration and air conditioning (ICR) sector plan** | | | | | | | | | | | | | |
| 2.1.1 | Sector Lead IA (UNDP) agreed funding (US $) | 13,368,756 | 20,000,000 | 12,000,000 | 16,000,000 | 16,000,000 | 11,776,041 | - | - | - | - | - | 89,144,797 |
| 2.1.2 | Support costs for UNDP (US $) | 935,813 | 1,300,000 | 780,000 | 1,040,000 | 1,040,000 | 765,443 | - | - | - | - | - | 5,861,256 |
| **Funding extruded polystyrene (XPS) foam sector plan** | | | | | | | | | | | | | |
| 2.2.1 | Sector Lead IA (UNIDO) agreed funding (US $) | 7,514,867 | 8,732,614 | 8,000,000 | 9,243,486 | 9,600,000 | 14,788,765 | 11,400,000 | 11,300,000 | 9,550,000 | 9,600,000 | 11,971,763 | 111,701,495 |
| 2.2.2 | Support costs for UNIDO (US $) | 526,041 | 567,620 | 520,000 | 600,827 | 624,000 | 961,270 | 741,000 | 734,500 | 620,750 | 624,000 | 778,165 | 7,298,172 |
| 2.2.3 | Sector cooperating agency (Germany) agreed funding (US $) | - | 267,386 | | 356,514 | | 211,235 | | | 250,000 | - | - | 1,085,135 |
| 2.2.4 | Support costs for Germany (US $) | - | 31,877 | - | 42,502 | - | 25,183 | - | - | 29,804 | - | - | 129,365 |
| **Funding polyurethane (PU) foam sector plan** | | | | | | | | | | | | | |
| 2.3.1 | Sector Lead IA (World Bank) agreed funding (US $) | 7,045,027 | 10,600,000 | 9,500,000 | 12,700,000 | 12,700,000 | 20,000,000 | 15,700,000 | 15,600,000 | 10,500,000 | 13,100,000 | 14,026,183 | 141,471,210 |
| 2.3.2 | Support costs for World Bank (US $) | 493,152 | 689,000 | 617,500 | 825,500 | 825,500 | 1,300,000 | 1,020,500 | 1,014,000 | 682,500 | 851,500 | 911,702 | 9,230,854 |
| **Funding room air conditioning (RAC) sector plan** | | | | | | | | | | | | | |
| 2.4.1 | Sector Lead IA (UNIDO) agreed funding (US $) | 14,671,089 | 16,000,000 | 18,000,000 | 14,000,000 | 14,000,000 | 11,581,816 | - | - | - | - | - | 88,252,905 |
| 2.4.2 | Support costs for UNIDO (US $) | 1,026,976 | 1,040,000 | 1,170,000 | 910,000 | 910,000 | 752,818 | - | - | - | - | - | 5,809,794 |
| 2.4.3 | Sector cooperating agency (Italy) agreed funding (US $) | 891,892 | - | - | - | - | - | - | - | - | - | - | 891,892 |
| 2.4.4 | Support costs for Italy (US $) | 108,108 | - | - | - | - | - | - | - | - | - | - | 108,108 |

| Row | Particulars | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Funding service sector plan, including enabling programme** | | | | | | | | | | | | | |
| 2.5.1 | Sector Lead IA (UN Environment) agreed funding (US $) | 3,299,132 | 2,570,000 | 3,270,000 | 3,370,000 | 3,570,000 | 2,810,868 | - | - | - | - | - | 18,890,000 |
| 2.5.2 | Support costs for UN Environment (US $) | 364,651 | 284,061 | 361,431 | 372,484 | 394,590 | 310,684 | - | - | - | - | - | 2,087,900 |
| 2.5.3 | Sector cooperating agency (Germany) agreed funding (US $) | 300,000 | - | 300,000 | 200,000 | - | 200,000 | - | - | - | - | - | 1,000,000 |
| 2.5.4 | Support costs for Germany (US $) | 36,000 | - | 36,000 | 24,000 | - | 24,000 | - | - | - | - | - | 120,000 |
| 2.5.5 | Sector cooperating agency (Japan) agreed funding (US $) | 80,000 | 80,000 | 80,000 | 80,000 | 80,000 | - | - | - | - | - | - | 400,000 |
| 2.5.6 | Support costs for Japan (US $) | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | - | - | - | - | - | - | 52,000 |
| **Funding solvent sector plan** | | | | | | | | | | | | | |
| 2.6.1 | Overall Lead IA (UNDP) agreed funding (US $) | 2,821,937 | 3,777,190 | 2,959,930 | 3,229,030 | 3,601,083 | 7,888,921 | 7,128,589 | 3,664,360 | 5,481,592 | 2,707,880 | 4,002,054 | 47,262,566 |
| 2.6.2 | Support costs for UNDP (US $) | 197,536 | 245,517 | 192,396 | 209,887 | 234,070 | 512,780 | 463,358 | 238,183 | 356,304 | 176,012 | 260,134 | 3,086,177 |
| **Overall funding** | | | | | | | | | | | | | |
| 3.1 | Total agreed funding (US $) | 49,992,700 | 62,027,190 | 54,109,930 | 59,179,030 | 59,551,083 | 69,257,646 | 34,228,589 | 30,564,360 | 25,781,592 | 25,407,880 | 30,000,000 | 500,100,000 |
| 3.2 | Total support cost (US $) | 3,698,676 | 4,168,474 | 3,687,727 | 4,035,600 | 4,038,560 | 4,652,176 | 2,224,858 | 1,986,683 | 1,689,357 | 1,651,512 | 1,950,000 | 33,783,625 |
| 3.3 | Total agreed costs (US $) | 53,691,376 | 66,195,664 | 57,797,657 | 63,214,630 | 63,589,643 | 73,909,822 | 36,453,447 | 32,551,043 | 27,470,949 | 27,059,392 | 31,950,000 | 533,883,625 |

| Row | Particulars | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Phase-out and remaining eligible consumption** | | | | | | | | | | | | | |
| 4.1.1 | Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 3,878.80 |
| 4.1.2 | Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 1,479.72 |
| 4.1.3 | Remaining eligible consumption for HCFC-22 (ODP tonnes) | | | | | | | | | | | | 6,136.79 |
| 4.2.1 | Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 2.70 |
| 4.2.2 | Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 0.00 |
| 4.2.3 | Remaining eligible consumption for HCFC-123 (ODP tonnes) | | | | | | | | | | | | 7.43 |
| 4.3.1 | Total phase-out of HCFC-124 agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 0.00 |
| 4.3.2 | Phase-out of HCFC-124 to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 0.00 |
| 4.3.3 | Remaining eligible consumption for HCFC-124 (ODP tonnes) | | | | | | | | | | | | 3.07 |
| 4.4.1 | Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 4,187.18**** |
| 4.4.2 | Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 1,698.00 |
| 4.4.3 | Remaining eligible consumption for HCFC-141b (ODP tonnes) | | | | | | | | | | | | 0.00 |
| 4.5.1 | Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 646.02 |
| 4.5.2 | Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 267.47 |
| 4.5.3 | Remaining eligible consumption for HCFC-142b (ODP tonnes) | | | | | | | | | | | | 557.04 |
| 4.6.1 | Total phase-out of HCFC-225 agreed to be achieved under this Agreement (ODP tonnes) | | | | | | | | | | | | 1.13 |
| 4.6.2 | Phase-out of HCFC-225 to be achieved in previously approved projects (ODP tonnes) | | | | | | | | | | | | 0.00 |
| 4.6.3 | Remaining eligible consumption for HCFC-225 (ODP tonnes) | | | | | | | | | | | | 0.09 |

* Maximum allowable total consumption of Annex C, Group I substances for the period 2021 to 2026 would be determined at a later date, but would in no case be greater than 11,772 ODP tonnes prior to 2025, and no greater than 6,131 ODP tonnes thereafter.

** Maximum allowable total consumption of Annex C, Group I substances in the ICR sector for the period 2021 to 2026 would be determined later, but would in no case be greater than 1,609.9 ODP tonnes prior to 2025, and no greater than 781 ODP tonnes thereafter.

*** Maximum allowable total consumption of Annex C, Group I substances in the RAC sector for the period 2021 to 2026 would be determined later, but would in no case be greater than 2,259.7 ODP tonnes prior to 2025, and no greater than 1,335 ODP tonnes thereafter.

**** In accordance with decision 68/42(b), includes 137.83 ODP tonnes of HCFC-141b contained in exported pre-blended polyols.

Note: Date of completion of stage I as per stage I Agreement: 31 December 2019.

## APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the *last* meeting of the year specified in Appendix 2-A.

**APPENDIX 4-A: FORMAT OF TRANCHE IMPLEMENTATION REPORTS AND PLANS**

1. The submission of the Tranche Implementation Report and Plans for each sector tranche request will consist of the following parts:

(a) A narrative report, with data provided by tranche, describing the progress achieved since the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other; the amount of ODS phased out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives; the amount of co-funding provided by the Country for the HCFC reductions; successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information; information on and justification for any changes vis-à-vis the previously submitted Tranche Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes;

(b) An independent verification report of the consumption of the Substances, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(c) For sector plans with activities that include the conversion of manufacturing capacity, an independent verification report as per sub-paragraph 5(c) of the Agreement, including a random sample of at least five per cent of the manufacturing lines which had completed their conversion in the year to be verified, and specifying at a minimum the following information: name of the enterprises; level of the Substance consumption prior to conversion; the alternative technology that has been introduced including the alternative Substance consumption level; the manufacturing capacity and actual production level before and after conversion; and the detailed incremental cost of the conversion;

(d) A written description of the activities to be undertaken during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and the interdependence of the activities, any possible changes to the overall Plan that are foreseen, taking into account experiences made and progress achieved in the implementation of earlier tranches;

(e) A set of quantitative information for all Tranche Implementation Reports and Plans, submitted through an online database; and

(f) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(e).

2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:

(a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and

(b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

**APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES**

1. The Foreign Economic Cooperation Office/Ministry of Environmental Protection (FECO/MEP), as the National Ozone Unit, is responsible for the following:

(a) Co-ordinating the overall implementation of activities to be undertaken with assistance of the Lead IA, Sector Lead IAs and other Cooperating IAs;

(b) Developing and implementing national policies and legislations on the control of ODS;

(c) Monitoring national consumption based on production data and official import and export data for the Substances recorded by relevant government departments in line with sub-paragraph 5(b) of this Agreement;

(d) Supervising implementation of the national system of licensing and quotas for HCFC imports, production and exports, the quota system covering enterprises using large quantities of HCFC in the different consumption sectors, where applicable, and collect the consumption data to control the consumption growth and achieve reduction of HCFC consumption in those enterprises, where applicable;

(e) Managing consumption in those sectors with large amounts of small and medium-sized (SMEs) enterprises (e.g., XPS and PU foam, ICR, and solvent sectors), by limiting the quantities of the relevant substances to be sold to the domestic market;

(f) Supervising enterprises carrying out the conversion activities to ensure the phase-out target in those enterprises had been achieved; and

(g) Co-ordinate with Lead IA, Sector Lead IAs, and Cooperating IAs to facilitate the verification of the sector targets set in the Agreement and in the preparation of reports according to sub-paragraph 5(d) and Appendix 4-A of this Agreement.

**APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY**

1. The Lead IA will be responsible for a range of activities, including at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;

(b) Assisting the Country in preparation and submission of the Tranche Implementation Reports and Plans as per Appendix 4-A;

(c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;

(d) Fulfilling the reporting requirements for the overall plan as specified in Appendix 4-A for submission to the Executive Committee;

(e) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(d) and 1(e) of Appendix 4-A;

(f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, co-ordinate with the responsible Sector Lead IA to ensure that annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan are submitted until all activities foreseen had been completed and HCFC consumption targets had been met;

(g) Ensuring that appropriate independent technical experts carry out the technical reviews;

(h) Carrying out the required supervision missions;

(i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;

(j) With the Country, co-ordinating the activities of the Sector Lead IAs and Cooperating IAs, and ensuring appropriate sequence of activities;

(k) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country, the Sector Lead IAs and the Cooperating IAs, the allocation of the reductions to the different sectors and budget items and to the funding of the Sector Lead IAs and each Cooperating IA;

(l) Providing assistance with policy, management and technical support when required;

(m) Reaching consensus with the Sector Lead IAs and Cooperating IAs on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and

(n) Co-ordinating the annual financial audit of the income received from the implementing agencies, the disbursements by FECO/MEP to final beneficiaries, and the interest amount earned by FECO/MEP on the balances held by FECO/MEP.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results as per sub-paragraphs 5(c) of the Agreement and sub-paragraph 1(c) of Appendix 4-A. The Lead IA can delegate the task described in this paragraph to the respective Sector Lead IA on the understanding that such delegation will not interfere with the Lead IA's responsibility to carry out the verification of the HPMP results.

**APPENDIX 6-B: ROLE OF THE SECTOR LEAD IAs**

1. The Sector Lead IAs will be responsible for a range of activities described in their corresponding sector plan, including at least the following:

(a) Providing assistance for policy development, planning and management of sector programming as set out in the sector plans, when required;

(b) Ensuring verification of sector performance targets in line with paragraph 5(c) and progress of disbursement in accordance with this Agreement and with its specific internal procedures and requirements as set out in the relevant sectors and assisting the Country in the implementation and assessment of the activities;

(c) Fulfilling the reporting requirements for the sector Tranche Implementation Reports and Plans as specified in Appendix 4-A for submission to the Executive Committee and, where relevant, including the activities implemented by the Cooperating IAs;

(d) Ensuring that appropriate independent technical experts carry out the technical reviews;

(e) Carrying out required supervision missions;

(f) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;

(g) Ensuring that disbursements made to the Country are based on the use of the indicators;

(h) Where relevant, reaching consensus with the Cooperating IAs on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan;

(i) Timely releasing funds to the Country/participating enterprises for completing the activities related to the sector; and

(j) Ensuring financial verification of the activities implemented.

## APPENDIX 6-C: ROLE OF THE WORLD BANK IN THE VERIFICATION OF CONSUMPTION

1. In addition to its role as the Implementing Agency of the China HCFC Production Phase-out Management Plan, after consultation with the Country and taking into account any views expressed, the World Bank will select and mandate an independent entity to carry out the verification of the consumption of the Country as specified in row 1.2 of Appendix 2-A, as per sub-paragraph 5(b) of this Agreement and sub-paragraph 1(b) of Appendix 4-A.

## APPENDIX 6-D: ROLE OF THE COOPERATING IAs

1. The Cooperating IAs will be responsible for a range of activities described in each sector plan, including at least the following:

(a) Providing assistance for policy development, planning and management of the sector programming as set out in the respective sector plan, when required;

(b) Assisting the Country in the implementation and assessment of the activities, and referring to the Sector Lead IA to ensure a co-ordinated sequence in the activities;

(c) Providing reports to the Sector Lead IA on these activities as per Appendix 4-A;

(d) Reaching consensus with the Sector Lead IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and

(e) Ensuring financial verification of the activities implemented.

## APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US $115 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met, on the understanding that the maximum funding reduction would not exceed the funding level of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. Starting for the consumption in 2019, the amount of funding provided may be reduced by US $115 per ODP kg of consumption beyond the level defined in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4, or 1.3.5 of Appendix 2-A for each year in which the target specified in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4, or 1.3.5 of Appendix 2-A has not been met, on the understanding that compliance with the targets defined in rows 1.3.1, 1.3.2, 1.3.3, 1.3.4, and 1.3.5 would be assessed based on existing sectoral reporting arrangements under the progress report on the implementation of the country programme and Tranche Implementation Report and Plans, and would not be independently verified.

3. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.

## APPENDIX 8-A: SECTOR SPECIFIC ARRANGEMENTS

1. During stage II of the HPMP for the RAC sector, the Country agrees to convert at least:

(a) Twenty manufacturing lines for the production of RAC equipment to HC-290;

(b) Three compressor manufacturing lines to HC-290;

(c) Three residential HPWH manufacturing lines to HC-290; and

(d) Two residential HPWH manufacturing lines to R-744;

2. During stage II of the HPMP for the ICR sector, the Country agrees:

(a) That a maximum quantity of 3,150 metric tonnes (mt) in the unitary air-conditioning (UAC) sub-sector could be converted to HFC-32;

(b) That the Country would have flexibility in the UAC sub-sector to convert to alternatives with a lower GWP than HFC-32 as long as the cost and tonnage to be phased out remained the same;

(c) That the Country would have flexibility to convert industrial and commercial HPWH lines to HFC-32 on the understanding that UAC and industrial and commercial HPWH conversions to HFC-32 combined would not exceed 3,150 mt;

(d) That at least 20 per cent of the total phase-out of HCFC-22 in the ICR sector would be from the conversion of SMEs (i.e. those consuming 50 mt or less); and

(e) That, in sectors other than the UAC sub-sector, the Country would have flexibility to select from among the six low-GWP technologies identified in Table 8 of the ICR sector of document UNEP/OzL.Pro/ExCom/76/25, excluding HFC-32, and would make best efforts to ensure that the tonnage remained within 30 per cent of the amount specified for each technology in that table, at no additional cost to the Multilateral Fund, and that any deviation from that range would be reported to the Executive Committee for its consideration.

**Annex XXVI**

**AGREEMENT BETWEEN THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL AND THE GOVERNMENT OF CHINA FOR THE PHASE-OUT OF PRODUCTION OF HYDROCHLOROFLUOROCARBONS REQUIRED BY THE MONTREAL PROTOCOL**

1. This Agreement represents the understanding of the Government of China (the "Country") and the Executive Committee with respect to the total phase-out of production of the hydrochlorofluorocarbons (HCFCs) for controlled uses, as set out in Appendix 1-A ("The Substances") to this Agreement, and the freeze and 10 per cent baseline reduction foreseen for stage I of the HCFC Production Sector Phase-out Management Plan (HPPMP).

**Framework agreement for total phase-out**

2. The total compensation for the entire China HCFC production sector for phasing out HCFC production for controlled uses in accordance with the Montreal Protocol phase-out schedule shall not exceed US $385 million, inclusive of all project costs, excluding agency fees, with the allocation of payments beyond Stage I to be addressed in future stages.

3. The total amount of phase-out to be achieved under the HPPMP is 445,888 metric tonnes (MT), based on the verified 2010 ODS production data of: 310,000 MT of HCFC-22, 98,711 MT of HCFC-141b, 33,957 MT of HCFC-142b, 2,819 MT of HCFC-123 and 401 MT of HCFC-124.

4. Appendix 1-A to this Agreement establishes a starting point for aggregate reduction in HCFC production eligible for funding of 30,180 ODP tonnes (445,888 MT).

5. The Country agrees that funding for Stage I and beyond should be used to prioritize total permanent closure and dismantling of production lines.

6. The Country agrees:

(a) To retire an additional 24 per cent of the production capacity that was established as of 2010 beyond the total tonnage of 445,888 MT as mentioned in paragraph 3 above (i.e., 552,901 MT) to take into account average utilization of HCFC production capacity;

(b) The 552,901 MT includes all production lines based on the list of HCFC production plants, as specified in the addendum to the HPPMP referred to in paragraph 1 of Appendix 4-A of this Agreement, namely: (i) those production lines producing HCFCs for controlled uses that will be closed and dismantled; (ii) other production lines producing for both controlled uses and feedstock that will be retired as needed to achieve the target in paragraph 6(a); and

(c) Capacity closure and retirement strategies are to be further defined, monitored and updated in future tranche implementation work plans and progress reports.

7. The Country agrees to ensure that any funds in the possession of the Foreign Economic Cooperation Office/Ministry of the Environment (FECO/MEP) will return a reasonable rate of interest and that any interest will be offset in future tranches with the reporting requirements of FECO/MEP and the World Bank pursuant to decision 70/20(c) on the reporting on disbursement.

8. The Country will not provide funding in Stage I or beyond for the production line which produced CFCs in Zhejiang Juhua Fluoro-chemical Co. Ltd. in 2010.

9. The Country agrees to ensure that any compensated plant does not redirect any phased out HCFC production capacity toward feedstock, subject to a penalty to be specified in the agreement for each stage of the HPPMP.

10. The Country agrees to coordinate with its stakeholders and authorities to make best efforts to manage HCFC production and associated by-product production in HCFC plants in accordance with best practices to minimize associated climate impacts. The budget and activities for such coordination will be included in the tranche implementation work plan and progress report.

11. The Country agrees to optimize the implementation of the HPPMP and its addendum in order to minimize environmental and climate impacts as much as possible, including by giving priority to HCFC production closure to achieve the HCFC reduction targets set forth in Decision XIX/6 of the Nineteenth Meeting of the Parties to the Montreal Protocol.

12. The penalty is US$ 1.73 per kg/year of production in excess of the level required in this Agreement. The Country agrees that any compensated HCFC production plant that redirects any phased out HCFC production capacity to feedstock will be subject to the penalty to be specified in the agreement for each stage of the HPPMP.

**Stage I of the HPPMP**

13. Stage I of the HPPMP for the Country is approved in principle at a total of US $95 million to meet the freeze and 10 per cent reduction of the HCFC production baseline for compliance, inclusive of all project costs, excluding agency support costs, recognizing the Country's need to front-load payments, according to the following payment schedule: US $24 million for the 2013 tranche; US $23 million for the 2014 tranche; US $24 million for the 2015 tranche, and US $24 million for the 2016 tranche. The total funds for the 2014-2016 tranches will be released to the Country only after a verification report of prior year data confirming achievement of the previous production limits target has been approved by the Executive Committee.

14. Stage I of the HPPMP will result in a sustained level of 29,122 ODP tonnes by 2013 and 10 per cent reduction target of 26,210 ODP tonnes by 2015 in compliance with Montreal Protocol schedules**.**

15. The Country agrees to meet the annual production limits for the substances set out in row 1.2 ("Maximum Allowable Production of Annex C, Group I Substances") of Appendix 2-A ("The Targets, and Funding") to this Agreement, as well as in the reduction schedule for all substances mentioned in row 1.1 of Appendix 2-A.

16. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A ("The Targets, and Funding") to the Country. The Executive Committee will provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

17. The Country accepts that, by its acceptance of this Agreement and fulfilment by the Executive Committee of its funding obligations for stage I described in paragraph 16 above, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect of any production of each of the substances that exceeds the levels defined in rows 4.1.3, 4.2.3, 4.3.3, 4.4.3 and 4.5.3 of Appendix 2-A.

18. The Country agrees to implement this Agreement in accordance with stage I of the HPPMP submitted, and as modified by this Agreement with respect to funding levels and other conditions of approval specified in Executive Committee decision 69/28(e) , the addendum to the HPPMP referred to in paragraph 1 of Appendix 4-A, and the application of the flexibility clause as specified in paragraph 20 below as informed or requested in annual implementation work plans and progress reports. In accordance with paragraph 19(b), the Country will accept independent verification of achievement of the annual production limits set out in row 1.2 of Appendix 2-A. The aforementioned verification will be commissioned by the relevant implementing agency.

19. The Executive Committee will not provide the funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions at least twelve weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) The Country has met the targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years including the year in which this Agreement was approved;

(b) The achievement of these targets has been independently verified and the verification report will be submitted at least eight weeks in advance to the Secretariat of the relevant Executive Committee meeting, unless the Executive Committee decides that such verification is not required;

(c) The Country has submitted: annual implementation reports in the format in Appendix 4-A ("Format of Implementation Reports and Plans") covering each previous calendar year and confirming that the conditions set out in paragraphs 6 to 12 of this Agreement have been met where applicable; has achieved a significant level of implementation of activities initiated with previously approved tranches; and the rate of disbursement of funding available from the previously approved tranche exceeded 20 per cent; and

(d) The Country has submitted an annual implementation plan in the format in Appendix 4-A covering each calendar year up to and including the year for which the funding schedule foresees the submission of the next tranche or, in the case of the final tranche, until completion of all activities foreseen.

20. The Executive Committee agrees that the Country may have the flexibility to reallocate the approved funds, or part of the funds, according to the evolving circumstances, to achieve the smoothest reduction of production and phase-out of the substances specified in Appendix 1-A.

(a) Reallocations categorized as major changes must be documented in advance in an annual implementation plan and approved by the Executive Committee, as described in sub-paragraph 19(d) above. The documentation can also be provided as part of a revision to an existing annual implementation plan, to be submitted eight weeks prior to any meeting of the Executive Committee. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Modifications to any clause in this Agreement;

(iii) Provision of funding for programmes or activities not included in the current endorsed annual implementation plan involving costs exceeding 30 per cent of the total cost of the previous approved tranche;

(iv) Removal of activities in the annual implementation plan involving costs exceeding 30 per cent of the total cost of the previous approved tranche;

(v) Reallocations not categorized as major changes may be incorporated into the approved annual implementation plan being implemented at that time, and reported to the Executive Committee in the subsequent annual implementation report; and

(vi) Any funds remaining from Stage I of the HPPMP will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement with the understanding that the funds returned would not be deducted from the maximum level of funding for the overall phase-out.

21. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous annual implementation plans in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification, as described in paragraph 19(b) above.

22. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. The World Bank has agreed to be the lead implementing agency (the "Lead IA") in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which may be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA.

23. The Lead IA will be responsible for ensuring coordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification, as per paragraph 19(b) above. The Executive Committee agrees, in principle, to provide the Lead IA with the fees set out in row 2.2 of Appendix 2-A.

24. Should the Country, for any reason, not meet the targets for the phase-out of the substances set out in row 1.2 of Appendix 2-A or otherwise not comply with this Agreement, the Country agrees that it will not be entitled to the funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all its obligations that should have been met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the funding by the amount set out in Appendix 7-A (Reductions in Funding for Failure to Comply for Stage I) in respect of each kg of reduction in production not achieved in any one year and, in respect of any redirection of phased-out HCFC production capacity to feedstock uses by compensated HCFC production plant, as indicated in the addendum to the HPPMP. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once these decisions have been taken, this specific case will not be an impediment to receiving future tranches, as per paragraph 16 above.

25. Funding under this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the funding of any other HCFC production sector projects.

26. The Country will comply with any reasonable request by the Executive Committee or the Lead IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA with access to the information necessary to verify compliance with this Agreement.

27. Stage I of the reduction in production of HCFCs and the associated Agreement will be completed at the end of the year following the last year for which a maximum allowable total production level has been specified in Appendix 2-A. At that time, should there still be outstanding activities foreseen in the Plan and its subsequent revisions, as per paragraphs 19(d) and 20, the completion will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 2(a), 2(b), 2(d), and 2(e) of Appendix 4-A will continue until the time of completion of Stage I, unless otherwise specified by the Executive Committee.

28. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

## APPENDICES

### APPENDIX 1-A: THE SUBSTANCES

| Substance | Annex | Group | Starting point (2010) for aggregate reductions in production (ODP tonnes) |
|---|---|---|---|
| HCFC-22 | C | I | 17,050 |
| HCFC-141b | C | I | 10,858 |
| HCFC-142b | C | I | 2,207 |
| HCFC-123 | C | I | 56 |
| HCFC-124 | C | I | 9 |
| Total | | | 30,180 |

## APPENDIX 2-A: THE TARGETS, AND FUNDING FOR STAGE I OF THE AGREEMENT

| Row | Particulars | 2013 | 2014 | 2015 | 2016 | Total |
|---|---|---|---|---|---|---|
| 1.1 | Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes) | 1,058 | 0 | 2,912 | 0 | 3,970 |
| 1.2 | Maximum allowable total production of Annex C, Group I substances (ODP tonnes) | 29,122 | 29,122 | 26,210 | 26,210 | n/a |
| 2.1 | Lead IA (World Bank) agreed funding (US $million) | 24 | 23 | 24 | 24 | 95 |
| 2.2 | Support costs for Lead IA (US $million) | 1.344 | 1.288 | 1.344 | 1.344 | 5.320 |
| 3.1 | Total agreed funding (US $million) | 24 | 23 | 24 | 24 | 95 |
| 3.2 | Total support costs (US $million) | 1.344 | 1.288 | 1.344 | 1.344 | 5.320 |
| 3.3 | Total agreed costs (US $million) | 25.344 | 24.288 | 25.344 | 25.344 | 100.32 |
| 4.1.1 | Total phase-out of HCFC-22 agreed to be achieved under stage I of this Agreement (ODP tonnes) | | | | | 923 |
| 4.1.2 | Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes) | | | | | 0 |
| 4.1.3 | Remaining eligible production for HCFC-22 (ODP tonnes) | | | | | 16,127 |
| 4.2.1 | Total phase-out of HCFC-141b agreed to be achieved under stage I of this Agreement (ODP tonnes) | | | | | 2,606 |
| 4.2.2 | Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes) | | | | | 0 |
| 4.2.3 | Remaining eligible production for HCFC-141b (ODP tonnes) | | | | | 8,252 |
| 4.3.1 | Total phase-out of HCFC-142b agreed to be achieved under stage I of this Agreement (ODP tonnes) | | | | | 441 |
| 4.3.2 | Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes) | | | | | 0 |
| 4.3.3 | Remaining eligible production for HCFC-142b (ODP tonnes) | | | | | 1,766 |
| 4.4.1 | Total phase-out of HCFC-123 agreed to be achieved under stage I of this Agreement (ODP tonnes) | | | | | 0 |
| 4.4.2 | Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes) | | | | | 0 |
| 4.4.3 | Remaining eligible production for HCFC-123 (ODP tonnes) | | | | | 56 |
| 4.5.1 | Total phase-out of HCFC-124 agreed to be achieved under this stage I of Agreement (ODP tonnes) | | | | | 0 |
| 4.5.2 | Phase-out of HCFC-124 to be achieved in previously approved projects (ODP tonnes) | | | | | 0 |
| 4.5.3 | Remaining eligible production for HCFC-124 (ODP tonnes) | | | | | 9 |

## APPENDIX 3-A: FUNDING APPROVAL SCHEDULE FOR STAGE I

1. Funding for future work plan will be considered for approval at the last meeting of the Executive Committee in the year prior to the year of the work plan.

2. For example, the work plan for 2014 and the progress report for the first tranche of the HPPMP will be submitted to the last meeting in 2013. Funding will be transferred to the implementing agency upon approval of the work plan and not more than 30 per cent of this amount could be released to the Country before the approval of the verification report by the Executive Committee.

3. A final verification report for Stage I will be submitted in 2017 to verify 2016 production. The last tranche of Stage I will be disbursed in full upon the approval of the 2015 verification report by the Executive Committee.

**APPENDIX 4-A: FORMAT OF IMPLEMENTATION REPORTS AND PLANS FOR STAGE I**

1. The first implementation report and plan for stage I of the HPPMP will contain an addendum that takes into account the final level of funding for the total phase-out, and that approved for stage I, including the conditions of approval in decision 69/28(e). The addendum would further define the conditions of approval in particular with respect to how decision 69/28(e) would be implemented.

2. The submission of the implementation report and plan for each tranche request will consist of five parts:

(a) A narrative report, with data provided by calendar year, regarding the progress since the year prior to the previous report, reflecting the situation of the Country in regard to phase-out of the substances, how the different activities contribute to it, and how they relate to each other in Appendix 1-A. The report should include ODS phase-out as a direct result of the implementation of activities, by substance, to allow the Secretariat to provide the Executive Committee with information on the resulting change in climate-relevant emissions. It will address how the conditions of approval in decision 69/28(e) (paragraphs 4-12 of this Agreement) have been addressed, the actions/activities taken to achieve these conditions and their budgets both in the plan and the progress report. It will identify any redirection of phased-out production capacity, as specified in paragraph 3 of the Agreement that is compensated by the Agreement to production for feedstock use by plant and by plant line where applicable. The report and plan will indicate what capacities are closed and dismantled and the target for the next year. Controlled and feedstock production by plant line, if applicable, should be provided. The report should further highlight successes, experiences, and challenges related to the different activities included in the plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted annual implementation plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided in paragraph 20 of this Agreement, or other changes. The narrative report will cover all relevant years specified in sub-paragraph 19(a) of this Agreement and may, in addition, include information on activities in the current year;

(b) A verification report on the results of the HPPMP and the production of the substances listed in Appendix 1-A, as per sub-paragraph 19(b) of this Agreement. Unless otherwise decided by the Executive Committee, such a verification shall be provided together with each tranche request and, as specified in sub-paragraph 19(a) of this Agreement, will provide verification of production for all relevant years for which a verification report has not yet been noted by the Executive Committee;

(c) A written description of the activities to be undertaken up to and including the year of the planned submission of the next tranche request, highlighting the interdependence of the activities, and taking into account experience gained and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall plan and progress achieved, as well as any possible changes to the overall plan that are foreseen. The description should cover the years specified in sub-paragraph 19(d) of this Agreement and also specify and explain in detail such changes to the overall plan. This description of future activities may be submitted as a part of the same document as the narrative report under sub-paragraph (a) above;

(d) A set of quantitative information for all annual implementation reports and annual implementation plans is to be submitted through an online database. This quantitative information, to be submitted by calendar year with each tranche request, will amend the narratives and description for the report (in accordance with sub-paragraph (a) above) and the plan (in accordance with sub-paragraph (c) above), the annual implementation plan and any changes to the overall plan, and will cover the same time periods and activities; and

(e) An executive summary of around five paragraphs is to be submitted in order to summarize the information required by sub-paragraphs (a) to (d) above.

**APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES FOR STAGE I**

1. The overall monitoring will be the responsibility of the National Ozone Unit (NOU). The production will be monitored based on semi-annual reports provided by HCFC producers and confirmation by the NOU.

2. The NOU will also be responsible for reporting and shall submit the following reports in a timely manner:

(a) Annual reports on production of each substance for controlled and feedstock uses to be submitted to the Ozone Secretariat;

(b) Annual reports on progress in implementation of the country programme, to be submitted to the Executive Committee; and

(c) Project-related reports to be submitted to the Lead IA.

3. The Lead IA will carry out independent annual verifications at all producers for which tonnage was included in paragraph 3 of the Agreement for the years 2013-2016 to confirm that the HCFC production phase-out targets at the country level have been met. Annual HCFC production will be verified by following the Executive Committee's Guidelines and Standard Format for Verification of ODS Production Phase-out using the Montreal Protocol's definition of production i.e. (a) HCFC production is equal to the total annual HCFC production minus the total amount of HCFCs used in feedstock applications. The verification reports will be submitted to the Executive Committee in accordance with paragraph 19 of this Agreement.

**APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY FOR STAGE I**

1. The Lead IA will be responsible for the overall supervision of the implementation of the stage I of the reduction in production of HCFCs under this Agreement. The Lead IA supervision will include at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements, as set out in the Country's HPPMP and addendum;

(b) Assisting the Country in preparation of the implementation plans and subsequent reports, as per Appendix 4-A;

(c) Providing independent verification to the Executive Committee that the targets have been met and associated annual activities have been completed, as indicated in the implementation plan consistent with Appendix 4-A;

(d) Ensuring that experience and progress is reflected in updates of the overall plan and in future annual implementation plans, consistent with sub-paragraphs 2(c) and 2(d) of Appendix 4-A;

(e) Fulfilling the reporting requirements for the annual implementation reports, annual implementation plans and the overall plans, as specified in Appendix 4-A, for submission to the Executive Committee;

(f) Ensuring that appropriate independent technical experts carry out the technical reviews;

(g) Carrying out required supervision missions;

(h) Tracking implementation and use of funds to ensure that they are consistent with all the Lead IA policies and procedures, including safeguard policies, as well as Executive Committee policies and procedures and provisions of this Agreement;

(i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the implementation plan and accurate data reporting;

(j) In case of reductions in funding for failure to comply in accordance with paragraph 1 of this Agreement, to determine, in consultation with the Country, the allocation of the reductions to the different budget items and to the agency support cost of the Lead IA;

(k) Ensuring that disbursements made to the Country are based on the use of the indicators; and

(l) Providing assistance with policy, management and technical support, when required.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the results and the production of the substances mentioned in Appendix 1-A, as per sub-paragraph 19(b) of this Agreement and sub-paragraph 2(b) of Appendix 4-A.

**APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY FOR STAGE I**

1. In accordance with paragraphs 12 and 24 of this Agreement, the amount of funding provided may be reduced by US$1.73 per kg/year of production beyond the level defined in row 1.2 of Appendix 2-A for each year from future funding tranches in which the target specified in row 1.2 of Appendix 2-A has not been met.

2. If any independent annual verification, as stipulated in paragraph 3 of Appendix 5-A to this Agreement, reveals that the phased out HCFC production capacity previously used for ODS production in 2010, as specified in paragraph 3 of the Agreement, in any HCFC production plants that are compensated by this Agreement is redirected to feedstock uses in a given year, the amount of funding may be reduced by US$0.15 per kg/year of redirected production from future funding.

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# Desk Study on the Current System of Monitoring Consumption of Foam Blowing Agent at Stage I HPMP Beneficiary Enterprises and Verification Methodology

**Desk Study on the Current System of Monitoring Consumption of Foam Blowing Agent at Stage I HPMP Beneficiary Enterprises and Verification Methodology**

# Contents

**Desk Study on the Current System of Monitoring Consumption of Foam Blowing Agent at Stage I HPMP Beneficiary Enterprises and Verification Methodology**

# I. Introduction

## A. ExCom Decision and Objective

1. At its 82nd meeting, the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol adopted Decision 82/67 on China's annual progress report for the polyurethane (PU) rigid foam sector plan under the Stage I HCFCs phase-out management plan (HPMP).

2. In line with Decision 82/67(c), the Government of China and the World Bank are requested to prepare for the 83rd meeting a desk study on the current system of monitoring consumption of foam blowing agents at enterprises assisted under the Stage I HPMP and a verification methodology that includes random sampling in order to ascertain whether ozone depleting substances (ODS) that has already been phased out have been or are being consumed at those enterprises.

## B. Structure of the Report

3. In order to respond to Decision 82/67(c), the Government of China worked with the World Bank on the structure of the report. This report is organized into an introduction and four main chapters.

4. Chapter 2 deals with contextual information surrounding HCFCs phase-out in the PU foam sector and more generally ODS control in China, explaining the legal basis, policy framework and institutional structures, and capacity for ODS management at both national and local levels. Chapter 2 also introduces the experience and practices carried over from the previous PU foam sector phase-out plan, as well as an overview of current monitoring requirements and policy measures for the PU foam sector plan under China's Stage I HPMP.

5. Chapter 3 details the established HCFCs consumption monitoring system for PU foam in China, including consumption verification practice during the preparation of the HPMP, the overall arrangements for the implementation of the sector plan under the HPMP, the monitoring system through the subproject cycle, and the monitoring and enforcement measures after conversions. The contributions to the monitoring system through relevant technical assistance activities carried out under the Stage I HPMP sector plan are summarized under this chapter as well.

6. Chapter 4 summarizes the proven/best practices in monitoring and verification of consumption and phase-out in the PU foam sector in China, and also assesses gaps and identifies areas for strengthening.

7. Chapter 5 responds to Decision 82/67(c), that proposes a "verification methodology in order to ascertain whether ODS that had already been phased out had been or were being consumed at those enterprises assisted under the stage I of the HPMP." In this chapter, a proposed methodology, largely based on the current monitoring and verification mechanism applied under the Stage I HPMP, is presented. Additional measures, such as random sampling of foam products/pre-blended polyol and cross-regional checks, are considered as well, with the purpose to further strengthen monitoring and enforcement actions to ensure the sustainable phase-out of ODS in PU foam sector.

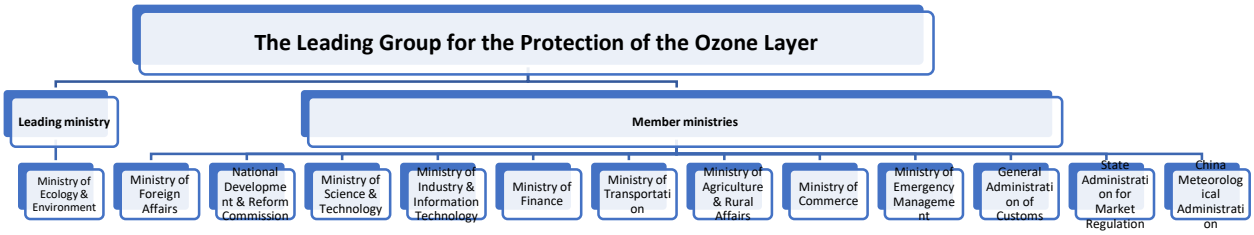
## II. HCFCs Phase-out in China's PU Foam Sector – In Context

8. The Montreal Protocol mandates gradual HCFCs phase-out starting from 2013 until full phase-out of HCFCs consumption and production by 2030 for "Article 5" countries. Guided by a series of national strategies and strong political commitment, China has nearly completed implementation of the first stage of HCFCs phase-out, having met all major phase-out milestones and phased out 71,000 MT of HCFC production as well as 45,000 MT of HCFC consumption. China's HCFC phase-out efforts are rooted in a well-established institutional and regulatory framework on environmental protection and historical ODS phase-out plans. That relevant to sustainable HCFCs phase-out and monitoring in the PU foam sector is described below.

### A. Institutional Structure for ODS Control in China

#### i. National-level institutional structure

9. *National Leading Group for the Protection of the Ozone Layer and its Office.* The National Leading Group for the Protection of the Ozone Layer (hereinafter referred to as the Leading Group) was set up in 1991 by the Government of China. The Leading Group is responsible for the coordination of critical matters related to the compliance with the Montreal Protocol, review of guiding principles and policies for compliance, review of the compliance programme and work plans and oversight of the implementation of the work plans, and dealing with emerging issues which require the considerations of the Leading Group. As the coordination mechanism for ozone layer protection at the central level consisting of 18 ministries at its beginning, the Leading Group has been adjusting its members with the institutional reforms of the Government of China in the past years. With the most recent restructuring of government agencies undertaken in 2018, the Leading Group is now composed of thirteen ministries. Ministry of Ecology and Environment (MEE, formerly known as MEP), as the leading ministry of the Leading Group, is responsible for the supervision and examination of the implementation of the Montreal Protocol, organization of compliance activities and formulation of policies and measures. Its specific work is undertaken by the Office of the leading group.




10. *National Office for Management of ODS Import and Export.* As another key body for ensuring compliance, National Office for Management of ODS Import and Export was co-established by three ministries, including MEE, Ministry of Commerce (MOC) and General Administration of Customs (GAC) in 2000. Its main responsibilities are the management of import and export of controlled substances, appliances and products in China through licensing, quotas and other measures. China is currently the largest ODS producer and exporter accounting for 80% of world exports, destined to more than 130 countries. The National Office has been acting as the lead coordination agency in ODS trade control in China, and has played a proactive role in information exchange, capacity building, law enforcement support and inter-agency cooperation.

11. *Coordination Group for the Compliance with the Montreal Protocol within MEE and its Office (National Ozone Unit).* Coordination Group for the Compliance with the Montreal Protocol within MEE (hereinafter referred to as the Coordination Group) consists of 9 departments and affiliated agencies of

MEE, whose specific work is undertaken by its Office. The Office of the Coordination Group, which undertakes the daily work of the Office of the Leading Group internally, functions as the National Ozone Unit (NOU) of China. As the national focal point of the Protocol and the MLF ExCom, the Office is responsible for daily liaison with the Ozone Secretariat, MLF Secretariat and the international implementing agencies. The Office of the Coordination Group is set up under the Department of Atmospheric Environment, MEE, with Department of Atmospheric Environment, Department of International Cooperation and FECO as members.

12. *Role of industrial association and research institutions*. The Government of China works closely with relevant industrial associations and research institutions, which include China Household Electrical Appliances Associations, China Refrigeration and Air-conditioning Industry Association, China Plastics Processing Industry Association (CPPIA, focusing on foam), China Association of Fluorine And Silicone Industry and Peking University. These technical support agencies contribute in large to data collection in sectors and of potential beneficiaries, as well as to the selection of conversion technologies, compilation of sector phase-out strategies, and development and preparation of phase-out project documents. Some provide consultancy services and assistance to relevant departments in the course of policy implementation for the compliance with the Montreal Protocol.

ii. Local Ecology and Environment Bureau (EEB) and other authorities

13. China is the world's most populated country and has a large geographic area. It takes efforts of both the central government and local governments to ensure sustainable compliance in the country. The Government of China, therefore, relies on local government to monitor and supervise ODS phase-out. Thirty-one provinces, autonomous regions and municipalities have each established analogous leading groups for ozone layer protection at the provincial level. These groups are responsible for: 1) interpreting, formulating and implementing related regulations and policies at local levels; 2) monitoring the production, consumption, import and export of controlled substances at local levels; 3) collecting ODS production and consumption data by pollutant emission registration and reporting systems; 4) controlling the construction and/or expansion of ODS producing or using facilities through a "construction projects management system" and environmental impact assessment; and, 5) enforcing local and state-level regulation and policy.

14. Departments of the EEBs, Development and Reform Commissions, Industrial and Commercial Bureaus, Public Security Bureaus and other competent authorities are also members of local leading groups in some provinces. It is mandated that local groups shall organize regular work meetings to coordinate the protection of the ozone layer within administrative regions. Local government at or above the county level, in accordance with the 2010 Regulations on Administration of Ozone Depleting Substances (hereinafter referred to as the Regulations), is responsible for the supervision and management of ODS production, use and phase-out within its jurisdiction. EEBs monitor ODS use, production, stockpiles, disposal and registration of all relevant companies, conduct inspections, enforce juridical authority to combat illegal use, production, disposal, and levy fines. Aside the responsibilities prescribed by the Regulations, local EEBs also volunteer to provide assistance for the implementation of sector plans under the HPMP, including mobilizing potential beneficiaries, cross checking production and consumption data, conducting environmental assessments and promoting alternative technologies.

iii. Interaction between State and local level competent authorities.

15. The interaction of State level competent authorities with local authorities revolves around the implementation and execution of overarching environmental and ODS laws and regulations (described in the next section). On the legislation side, the People's Congress issues laws, the State Council issues regulations, the line ministries issues orders or normative documents, and in turn the local levels will issue local policy documents with detailed implementation guidance. On the administrative side, the relationship

between the state and local level is more interactive. This is particularly the case on policy implementation, monitoring and enforcement.

## B. Legal Basis and Policy Framework for HCFCs Management and Control in the Foam Sector

### i. Relevant environmental laws

16. In recent years, the Government of China has taken a series of significant decisions and actions on promoting an "ecological civilization" and protecting the environment. To implement the strictest laws on ecological and environmental protection, China has promulgated or amended nearly twenty laws including the Law on Environmental Protection, the Law on Air Pollution Control and Prevention, and others. The Law on Environmental Protection, revised and issued by the National People's Congress in 2014 and effective in 2015, has recrafted the basic system of environmental protection in China. The most significant change with the amendment is reinforcement of the responsibility of the local government to ensure environmental quality. The law empowers local government to enforce rules and to crack down on illegal behavior, specifically through devolution of power and resources to environmental law enforcement departments for strengthened enforcement.

17. Article 85 of the 2015 revised Law on Air Pollution Control and Prevention stipulates: "The State encourages and supports the production and use of ODS alternatives, and the gradual reduction of the production and use of ODS until complete phase-out." "The State implements the total control amount and manages the quota for the production, use, import and export of ODS." The specific measures will be prescribed by the State Council In addition, Article 101 now stipulates the types of penalties and the punishment of maximum three times of the value of the goods for the production, import, sale or use of banned substances/equipment in violation of the provisions of relevant laws and regulations. If the offender refuses to make corrections, the local government is entitled to suspend its operation or close it down. Article 125 also stipulates those who discharge air pollutants causing damage shall bear the consequences according to relevant laws and regulations. The amendment interlinked ODS management with the overall air pollution control that enables the ODS monitoring and enforcement to be part of the holistic combat of air pollution for both national level and local levels. The amendment also provided strict enforcement tools for ODS violators that would face more severe punishment and penalties than before.

18. The amended Laws on Environmental Protection and on Air Pollution Control and Prevention therefore intensify punishment of illegal behaviors. And, given that they are superior to the ODS Regulations and relevant secondary rules and policy, they provide the legal authority for strengthened ODS supervision and management in the future.

### ii. ODS Regulations, rule and policies

19. The ODS management regulations (Decree No. 573), approved at the 104$^{th}$ standing meeting of the State Council and effective since June 1, 2010, provide a systematic legal framework for ODS management in China. They reinforce the role of State-level departments in supervision and administration of ODS through-out China and stipulate that local EEBs and relevant departments at or above the county level shall be responsible for management and oversight of ODS within their regional jurisdictions. Most notably the regulations introduce a type of permitting/quota system for all ODS producers and users whereby enterprises must apply for and report on production and use under the competent environmental protection department of the State Council (MEE in this case). The 2010 Regulations also lay out the responsibilities of competent authorities and ODS producers/users in supervision and inspection, requirements for a sound ODS management data system and ranges, and describes the penal system including fines. For example, a

user of ODS without a permit is subject to a fine up to 500,000 yuan, along with the penalty of dismantling and destruction of the facilities using ODS.

20. More than 100 ODS supporting rules and policies have been formulated and issued at multiple levels throughout China in order to detail how to implement and to further strengthen ODS control. About fifteen of these relate directly to the foam sector. Most have been introduced in conjunction with the Stage I HPMP and HPPMP preparation and implementation (policies relevant to the HCFCs phase-out in the foam sector are found below in Table 1 under Section D). They consist primarily of orders (from the State Council) or "management letters" (from line ministries) to subordinate departments within the government or to outside entities in the private sector. For orders/letters within government institutions, their implementation is closely linked to annual performance reviews and promotions. In the case of the private sector, violation of management letters is governed by administrative laws. Punishment for such violation ranges from warnings to fines, administrative detention and business license revocation.

21. Now with the changes to the environmental and air pollution laws, local EEBs have more authority such as to conduct on-site visits and collect sample in enterprises, seal up illegal production facilities, and establish local standards in matters of regional environment monitoring and enforcement.

## C. Experience and Practice from the Previous PU Foam Sector Phase-out Plan

### i. Development of the system of verifying and monitoring consumption

22. Since the approval of the PU foam sector CFCs phase-out plan in 2001, China has employed some type of mechanism to verify consumption at conversion subprojects. In the earlier years of the sector plan, FECO had designated individual technical experts to conduct on-site verification prior to the signature of subgrant agreements (SGAs) with beneficiary enterprises, with the aim to identify the eligibility and baseline ODS consumption level of these enterprises.

23. As implementation of the sector plan evolved, more and more enterprises became involved in conversion activities. Due to this growing complexity as well as various financial and technical capacities of the enterprises, FECO decided to utilize an independent accounting firm to conduct baseline ODS consumption verification at enterprises. Focused primarily on reviewing records (purchase receipts, invoices, production logs, etc.), this third-party review offered FECO more neutrality while elevating the verification vis-à-vis the enterprises to a more official level.

24. Nonetheless, it was necessary to supplement the work of the accounting firm with foam manufacturing technical expertise and support, in order to corroborate the eligibility and baseline ODS consumption, with inspection of production facilities, storage areas and baseline equipment. This was especially the case at enterprises with less capacity for bookkeeping. The combined technical and performance verification became the foundation for effective subproject monitoring and reporting by FECO and its designated implementing support agency (ISA). In addition, random checks and inspections to examine the eligibility of the enterprises and identify any issues during the implementation by the World Bank as the MLF Implementing Agency were integrated into the monitoring framework developed under the CFCs phase-out plan in the foam sector.

25. As more subprojects completed and moved to "subproject acceptance," whereby local authorities officially declared converted operations were up to par with environmental and safety regulations, FECO recognized the potential of local EEBs to expand their roles to more targeted monitoring and supervision of ODS-consuming enterprises in the foam sector. FECO cooperated in particular with the four key provinces with the highest concentration of PU foam enterprises, namely Shan Dong, Jiang Su, Zhe Jiang and Guang Dong. With technical assistance funding, tasks for these provinces included training and

awareness raising regarding foam manufacturing in the region, active identification of additional eligible enterprises beyond those first covered by FECO, and most notably, undertaking regular monitoring and enforcement action in the sector.

26. By the end of the sector plan when China issued the ban on the use of CFCs as blowing agent in 2007, the key foam-producing provinces had been well-informed with the issues surrounding ODS phase-out and had the legal basis for taking over regular monitoring and supervision of CFCs phase-out in this sector. Moreover, through the subproject acceptance/handover process and ongoing TA to the EEBs, networks between regulatory authorities and major foam manufacturers could be established although there was no systematic procedure in place to register and track ODS-using enterprises.

ii. Lessons Learned

27. With the implementation of the CFCs phase-out plan for the PU foam sector, not only were ODS phase-out targets achieved but extensive experience was accumulated, in particular on verification and monitoring. This significantly contributed to the development of future HCFCs phase-out activities in this sector. Key lessons learned were:

- The combination of financial support and specific policy measures employed by the sector plan was not only an effective strategy for achieving timely ODS phase-out, it provided the underpinning for more regular monitoring by local authorities beyond the project
- The PU foam sector plan, including TA support to the EEBs to build relationships with the regulated community, as well as sector policy, also benefitted the beneficiaries that successfully converted to alternatives by creating a level playing field for them.
- Establishment of an effective policy system is critical to sustainable ODS phase-out but requires understanding of who is the regulated community for appropriate monitoring, enforcement and outreach over time.
- Involvement of local EEBs in the management and monitoring of ODS phase-out is key to long-term sustainability of sector and subsector conversions. Local EEBs played a key role in ODS management, particularly in the enforcement after awareness, technical and policy capacity building provided by the project.
- Baseline consumption verification conducted by independent accounting firms prior to the signature of SGAs and performance and financial verification during the implementation is important to ensure the smooth execution of subprojects as well as verifiable achievement of phase-out targets.
- Public awareness on ODS phase-out and participation of individuals and industry in carrying out activities to protect the ozone layer needs to be continuously promoted beyond the confines of a project, especially where there are differences in timing and ODS targeted for phase-out.
- Various technical assistance activities carried out under the sector plan, particularly foam enterprise training and technical research and studies, were a notable complement to ODS phase-out subprojects. They facilitated access to and promoted adoption of alternative technologies at a large number of foam enterprises.

## D. The PU Foam Sector Plan under China's Stage I HPMP

28. The PU foam sector plan under China's Stage I HPMP was prepared by FECO in affiliation with MEE and with the assistance of the World Bank. It was submitted to the 62nd ExCom meeting for approval in August 2010. A total of US$73,000,000 was approved by the 64th ExCom meeting in 2011 to support HCFC-141b phase-out activities in the PU foam sector in China, in order to achieve the national baseline consumption freeze target by 2013 and the 10% reduction target by 2015.

i. Approval Decision and China-Executive Committee Agreement

29. At its 64th meeting, the Executive Committee adopted Decision 64/49 approving China's Stage I HPMP. A draft agreement between the Government of China and the Executive Committee for the reduction in consumption of HCFCs (hereinafter referred to as "the Agreement") was also approved. Subsequently, the agreement was revised twice at the 66th and 67th ExCom meetings through Decisions 66/15(h) and 67/20 to primarily update Appendix 5-A on "monitoring institutions and roles," and to include China's Article 7 reported HCFCs baseline. Appendix 2-A of the Agreement defines the Montreal Protocol HCFCs reduction schedule, the maximum allowable HCFCs consumption and the maximum allowable HCFCs consumption in the PU foam sector in China, respectively. China committed to phase-out 942.6 ODP tons of HCFC-141b by 2015 as indicated in the following table. Decision text related to the Stage I PU foam sector plan is found in Annex 1.

| | | 2011 | 2012 | 2013 | 2014 | 2015 | Total |
|---|---|---|---|---|---|---|---|
| **1.1** | **Montreal Protocol reduction schedule of HCFCs (ODP tonnes)** | n/a | n/a | 19,269.0 | 19,269.0 | 17,342.1 | n/a |
| **1.2** | **Maximum allowable total consumption of HCFCs (ODP tonnes)** | n/a | n/a | 18,865.4 | 18,865.4 | 16,978.9 | n/a |
| **1.3.3** | **Maximum allowable consumption in the PU foam sector (ODP tonnes)** | n/a | n/a | 5,392.2 | 5,392.2 | 4,449.6 | n/a |

ii. Monitoring and verification requirements and other related provisions per the Agreement

30. The Agreement sets forth monitoring and verification requirements in order to ensure sustained achievement of agreed HPMP consumption reduction commitments as captured above. Compliance with the Agreement is assured through two mechanisms. First, in accordance with the Agreement, China must accept independent verification of completion of the conversion of manufacturing capacity as well as achievement of annual HCFCs consumption limits as set out in row 1.2 of Appendix 2-A of the Agreement. Independent verification is one of the preconditions for the release of tranches for the sector plan after China meets the target set out in row 1.2 of Appendix 2-A of a given year. Specifically, in line with Article 5 (b) (i) of the Agreement, a verification report of a random sample of at least 5% of the manufacturing lines which have completed conversion in the year to be verified must be submitted to the ExCom, on the understanding that the total aggregated HCFCs consumption of the random sample of the manufacturing lines represents at least 10% of the sector consumption phased out in that year.

31. Second, the Agreement requires that China conducts accurate monitoring of its activities under the Agreement, while establishing and maintaining a system to monitor HCFCs consumption in different sectors. The institutions identified in Appendix 5-A, namely FECO and MEE, should monitor and report on the implementation of the activities in previous annual implementation plans as set out in appendix. Activities monitored are also subject to independent verification and comprise, per Appendix 5-A, the following:

- FECO/MEP is responsible for the overall co-ordination of activities to be undertaken in the HPMP with assistance of the Lead IA and acts as the National Ozone Unit, responsible for carrying out national policies and legislation on ODS control.
- National consumption will be monitored and determined based on production data and official import and export data for substances recorded by relevant government departments in line with the Agreement.

- In addition to the national system of licensing and quotas for HCFCs imports, production, and exports, a quota system covering enterprises using large quantities of HCFCs in the different consumption sectors, will be established to control consumption growth, achieve the consumption reduction in these enterprises and collect consumption data.
- For sectors with large amounts of small and medium enterprises (SMEs), like in the PU foam sector, the consumption is managed by limiting quantities of HCFC-141b to be sold to the domestic market.
- FECO/MEP will closely supervise enterprises carrying out Stage I HPMP conversion activities to ensure the phase-out target in these enterprises has been achieved.
- FECO/MEP will co-ordinate with the Lead IA and Cooperating IAs to facilitate the verification of the targets set in the Agreement.

32. In case for any reason China did not meet the reduction targets or otherwise comply with the Agreement despite monitoring measures, it would not be entitled to future funding per the approval schedule. In addition, Appendix 7-A imposes a penalty provision whereby funding provided might be reduced by US$160 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target had not been met.

iii. HPMP and HCFCs foam sector policy measures

33. In line with Appendix 5-A of the Agreement and in addition to the national system of licensing and quotas for HCFCs imports, production and exports, a quota system covering enterprises using large quantities of HCFCs in the different consumption sectors, should be established to control the consumption growth, achieve the consumption reduction in those enterprises and collect consumption data.

34. In response to above requirement to effectively control the consumption growth of HCFCs, on August 7, 2013, MEE issued the Circular on the Management of HCFCs production, sales and consumption under the 2010 ODS Regulations. The circular presented a division of labor according to consumption levels whereby HCFCs consumers with more than 100 MT of annual HCFCs consumption for controlled uses should apply for and hold quota permits with MEE, while those with less than 100 MT of annual HCFCs consumption for controlled uses should register with provincial environmental protection agencies. MEE is responsible for the formulation of the overall quota allocation scheme for each year. HCFCs distributors, including system houses in the PU foam sector, with sales volume of HCFCs over 1000 MT must register with MEE whereas all HCFCs distributors under this threshold must register with local competent environmental protection agencies.

35. In terms of process, the Regulations and the Circular require that HCFC-consuming enterprises over 100 MT apply to MEE for a quota for the next year before October 31 of each year, and submit supporting documentation proving that the enterprise is eligible for consuming HCFCs, has obtained places, facilities, equipment and professional technicians that can utilize HCFCs for manufacturing, and has approved environmental protection facilities and a sound internal management system.

36. The MEE then evaluates the annual allowable production limits of HCFCs and the market's need for HCFCs among different sectors and reviews the consumption quotas from the applicants for the next year. MEE shall complete the review before December 20. Only when the applicants meet the requirements, MEE issues the consumption quota license for the next year. MEE also copies the relevant provincial EEBs where the enterprises are located on this issuance. In case of the rejection of the application, MEE notifies the applicant in writing with the reasons.

**HCFCs registration practice in Shanghai**

Shanghai has established the HCFCs registration system since 2013, in accordance with 2010 ODS Regulations and *the Circular on the Management of HCFCs production, sales and consumption* issued by MEE. In 2014, Shanghai issued *the Circular on the Registration Management of HCFCs production, consumption, sales and servicing at its municipality level*. Each year, Shanghai published the notification on the registration management and disclosed the results of registration to public.

Shanghai so far has developed online registration system, and the operation of the system is proven effective and efficient. The registration information includes the basic information of enterprises, sectors/applications, species of HCFCs, the amount of HCFCs consumption/sales, etc.

Summary of HCFC registration information in Shanghai from 2013-2018

| Year | | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|
| Sectors | | Number of enterprises | | | | | |
| Feedstock use | | 6 | 7 | 6 | 5 | 3 | 2 |
| Controlled uses | Solvent | 15 | 15 | 13 | 13 | 10 | 11 |
| | Foam | 15 | 15 | 14 | 14 | 15 | 16 |
| | Refrigeration | 20 | 19 | 19 | 19 | 16 | 15 |
| Sales | | 41 | 46 | 47 | 48 | 44 | 33 |
| **Total** | | 95 | 100 | 97 | 97 | 88 | 77 |

37. Aside the policy measures required in the Agreement, the PU foam sector plan under the Stage I HPMP also proposed targeted policy and regulatory measures to promote HCFCs phase-out at the subsector level to ensure sustainable phase-out and a level playing field. The PU foam sector plan prioritized the refrigerated container and reefer, refrigerator and freezer, and electrical water-heater subsectors. In October 2018, MEE issued *the Ban on the Use of HCFC-141b as Blowing Agent in Manufacturing of Products in Refrigerated Container and Reefer Sub-sector, Refrigerator and Freezer Sub-sector and Electrical Water-heater Subsector*. Since January 1st, 2019, no enterprise is permitted to use HCFC-141b as blowing agent for these types of products. Any violation will result in financial penalties of up to 500,000 yuan, possibly along with the penalty of dismantling and destruction of the facilities using ODS.

*Table 1. National Level ODS Supporting Policies Currently Relevant to the PU Foam Sector*

| Classification | Policy | Time of Issuance | Effective Date | Issuer |
|---|---|---|---|---|
| Production control | Management notice on construction projects of ODS production and use (No.[2018] 5) | 2018.1.24 | 2018.1.24 | MEP |
| | Management notice on the strengthening of HCFCs production, sale and use (No. [2013] 179) | 2013.8.7 | 2013.8.7 | MEP |
| Import and export control | Management Measures of Import and Export on ODS (revised) | 2014.1.21 | 2014.3.1 | MEP, MOC, Custom |
| | China import and export list of controlled ODS (six batches) | 2000/2001/2004/ 2006/2009/2012 | 2000/2001/2004/ 2006/2009/2012 | MEP, MOC, Custom |

| | | | | |
|---|---|---|---|---|
| Consumption control | The ban on the use of CFCs as blowing agents in foam sector (No.2007 [45]) | 2007 | 2008.1.1 | MEP |
| | The ban on the production, sale, import and export of electrical household appliances using CFCs as refrigerants or blowing agents (No.2007 [200]) | 2007 | 2007.7.1 | MEP, NDRC, MOC, GAC, etc. |
| | Announcement on the ban on the production of refrigerator freezer products, refrigerated container products and electric water heater products with HCFC-141b as blowing agent (No.2018 [49]) | 2018.10.18 | 2019.1.1 | MEE |
| | Management notice on the strengthening of HCFCs production, sale and use (No. [2013] 179) | 2013.8.7 | 2013.8.7 | MEP |
| Sales management | Management notice on the strengthening of HCFCs production, sale and use (No. [2013] 179) | 2013.8.7 | 2013.8.7 | MEP |

## III. Established HCFCs Consumption Monitoring System for PU Foam

38. Now entering into the third comprehensive ODS phase-out sector plan for the foam sector, FECO is continuing to use and in some cases fine tune its system of monitoring and verification of HCFCs consumption and HCFCs phase-out through the overall project, and subproject cycles. Foam beneficiaries, once applying to participate in the project through completion and "subproject acceptance," are visited in total a minimum of 7 times by FECO, the World Bank, the ISA, the accounting/verification firm, technical consultants and local environmental and public security officials. Beneficiaries in turn must report their HCFCs consumption, among other data, on an annual basis to FECO up to subproject acceptance while registering with local EEBs during HCFC consumption. The established system is detailed below along the subproject cycle through hand-over to the provinces and other local authorities that are responsible for monitoring all ODS producers and users in parallel to the cohort of enterprises that take part in the foam sector plan. Along with the technical assistance (TA) for creating the enabling environment and supporting sustainable conversions, the overall sector plan is the underpinning to, as well as catalyst for longer term, sustained HCFCs phase-out.

### A. Understanding the Scope of HCFCs Use in the PU Foam Sector

39. The basis for not only determining priority subproject conversions for support under the HPMP, but also for monitoring HCFCs use in the foam sector, is an understanding of the market and enterprises that exist across subsectors. A bottom-up sector survey with on-site corroboration of a certain sample size of PU foam manufacturers, system houses companies was the primary resource that reflected HCFC-141b consumption levels and distribution of different applications.

40. However, FECO, along with industrial associations and independent consultants devised an additional methodology to quickly validate the overall findings of the survey of the scale of foam manufacturers, namely a mass balance of raw materials. By obtaining MDI consumption levels from market research companies and with the known ratio between MDI and polyols, the consumption of PU foam polyol was calculated. Subsequently, HCFC-141b consumption in each subsector was calculated using a common product ratio between polyols and HCFC-141b blowing agent. The figures of non-HCFC-141b blowing agents used in some subsectors were determined by the information obtained from chemical suppliers, the main consumers in the concerned subsectors, and cross-checked by the associations and sector experts, and then subsequently deducted. The results of the mass balance calculation were cross-checked with China's annual HCFCs production as well as discussed with sector experts and industrial

representatives from foam manufacturers and system house companies. Use of this tool provided FECO and stakeholders (associations, local EEBs etc.) better confidence in the overall scale and scope of ODS use in the foam sector to start with.

## B. Stage I HCFCs Consumption Phase-out Project Arrangements

### i. Environmental and social safeguard provisions

41. As the MLF implementing agency for the Stage I HPMP PU foam sector plan, the World Bank requires, in line with its safeguard policies, that an environmental and social safeguard framework be prepared and publicly disclosed by FECO before the overall HCFCs phase-out project Grant Agreement is signed between the Government of China and the Bank. The safeguards framework looks at China's environmental regulations and labor laws relevant to the project and evaluates potential environmental and social risks that may occur during project implementation. In the case of the Stage I HPMP, the framework lays out the required actions and procedures for beneficiaries to follow surrounding their PU foam conversions, taking into account all identified risks, to avoid or mitigate any negative impacts.

42. Consequently, all potential beneficiaries must prepare an environmental management plan (EMP) under the framework and inform the local EEB of plans to convert from HCFC-141b prior to starting conversion. An enterprise may be required to conduct anew an environmental impact assessment prior to conversion and receive an acceptance visit from local EEB or independent experts following local EEB instructions. The safeguard framework allows the local authorities to be aware of the conversion activities at the early stage of each subproject and include them in the ODS monitoring plan. Moreover, in the preparation and FECO acceptance of EMPs, related environmental impacts are identified on site. This serves as an additional check on the use of all hazardous and controlled substances that enterprises may be using in their operations.

### ii. Project implementation manual

43. The annual programs that are prepared by FECO and submitted to the ExCom for approval each year provide a summary of the phase-out impacts achieved through policy actions, investments, and technical assistance (TA) activities and identify the next planned actions. However, it is the project implementation manual (PIM), developed before launching HPMP implementation that details how implementation will proceed from subproject appraisal to standardized procedures for conversions, to monitoring and reporting steps and frequency. The PIM serves as a one-stop guide for both FECO and beneficiaries, capturing fiduciary and safeguard responsibilities, key ExCom decisions and policies, operational procedures, and various reporting templates.

44. According to the PIM, FECO is responsible for implementation and supervision of the sector plan, as well as subprojects along with technical support by the ISA. The World Bank and an independent verification agency are responsible for review and monitoring phase-out activities, including technical, social and environmental aspects. The local EEBs are responsible for supervision and inspection of foam enterprises during and after subprojects. Consumption verification activities in particular may be assigned to different implementing entities due to the varied nature of the tasks. Monitoring and verification under the HPMP and as detailed in the PIM are illustrated in the following table.

*Table II. Monitoring and Verification under HCFC-141b Phase-out Activities under the HPMP*

| Project Activities | Monitoring and Verification Actions | Results of Monitoring and Verification Actions | Verification Implementer(s) |
|---|---|---|---|
| Control HCFC-141b consumption in the PU foam sector | • Verify the annual production, import and export of HCFC-141b | • Compliance with annual control target of HCFC-141b is confirmed;<br>• HCFC-141b consumption in foam sector is determined. | World Bank, FECO |
| Fulfillment of annual program | • Annual financial audit of the sector plan;<br>• Inspection and verification of completed subprojects. | • Progress reports (implementation status of TA contract and phase-out sub-project and policy measures, etc.) were submitted to ExCom;<br>• AP Approved by ExCom;<br>• Performance verification report and financial audit report concluded. | World Bank, FECO |
| Subproject financial and technical appraisal | • On-site baseline consumption verification;<br>• Supporting documents on HCFC consumption, such as invoice, procurement contracts, production volume;<br>• Visual check of baseline equipment, and storage of pre-blend polyols and blowing agent;<br>• Evidence of starting business with HCFCs before the cut-off date (2007.9.21) reviewed. | • Baseline consumption of HCFC-141b verified;<br>• Eligibility of the enterprise confirmed. | ISA, selected accounting firm, independent experts, FECO |
| Subproject proposal evaluation | • Evaluation of the implementation plans prepared by enterprises in terms of cost effectiveness, feasibility of the selected alternative technology procurement plan, budget, and implementation schedule. | • Sub-grant funding level determined;<br>• Appropriate alternative technology identified;<br>• Feasibility of subproject proposal evaluated;<br>• EMP, ECP and/or RAP* prepared if needed. | The evaluation panel, including ISA, independent sector experts, safety experts and FECO |
| Subproject implementation through completion | • Random site visits to beneficiary enterprises;<br>• Onsite inspection of production lines;<br>• Interviews with beneficiaries. | • Subproject implementation progress examined;<br>• Technical or financial issues discussed;<br>• Compliance with Executive Committee checked;<br>• Environmental and social due diligence issues related to World Bank management reviewed. | World Bank task team |
| Subproject conversion | • On-site technical verifications against milestones set in SGA;<br>• On-site check for procured/retrofitted equipment;<br>• On-site check for safety measures;<br>• Review material purchase; documents and disbursement status;<br>• Interview on technical aspects. | • Consistency of supply contract and installed equipment checked;<br>• Safety modifications inspected;<br>• Trial run with new alternatives checked;<br>• Disbursement status and supporting documents examined. | ISA and independent safety experts |

| | | | |
|---|---|---|---|
| Subproject Beneficiary financial performance verification | • Performance and financial verifications during the conversion;<br>• On-site financial verification of disbursement related to the subproject;<br>• Verification of the halt in use of HCFC-141b;<br>• Verification of blowing agent/pre-blend polyols purchased;<br>• Confirm status of the baseline equipment (dismantled or not); | • Disbursement of ICC and/or IOC has reached 90% of the funding level confirmed;<br>• Operation status after conversion confirmed;<br>• The cut-off date of no more HCFC-141b consumption checked. | Selected accounting firm, independent experts |
| Subproject acceptance | • Subproject acceptance;<br>• Review subproject completion report;<br>• Onsite inspection of production lines;<br>• Interview with beneficiaries. | • Smooth production after conversion demonstrated;<br>• Environmental and/or safety approval following local regulations checked;<br>• Environmental and social due diligence examined;<br>• Enterprise commitment to no longer use ODS re-emphasized.<br>• Disposal of baseline equipment (where applicable) verified. | FECO, ISA, technical experts, local officials |
| TA activities | • Commissioning, execution and acceptance of TA activities. | • TA implementation progress reviewed;<br>• Outcomes that can facilitate sustainable HCFC-141b phase-out in the sector generated and evaluated. | FECO, ISA, and technical experts (where applicable) |
| Post Subproject Phase-out inspections | • Regular monitoring and enforcement post subproject acceptance (or for EIA renewal);<br>• Onsite inspection od compliance with national/local ODS management regulations. | • Quota for annual ODS consumption received, or enterprise is registered in the region;<br>• Compliance with national/local ODS management regulations;<br>• Blowing agents used by enterprises sampled, tested and inspected;<br>• Legal enforcement carried out if deviations from national ODS regulations. | MEE and local EEBs |

EMP=environment management plan; ECP= environmental code of practice; and RAP = resettlement action plan

45. In addition to the monitoring and verification that takes place at the above project junctures, there are secondary opportunities to support monitoring and verification of ODS phase-out. For example, in procurement "prior" reviews by the World Bank per its requirements, there may be areas in the proposed terms of reference for a monitoring activity that can be strengthened. Or, a procurement review by FECO of beneficiary enterprises may lead to a recommendation in specifications that will enhance sustainability of the conversion.

## C. Monitoring system through the subproject cycle

### i. Subproject baseline verification

46. According to the requirement from the PIM, each enterprise that applies for MLF support through a subproject proposal under the Stage I HPMP requires on-site verification organized by FECO. A two-

prong verification approach as described for the CFCs foam sector plan in Chapter II is still employed with both independent financial and technical experts who are selected by FECO through an open and competitive selection process. According to the consultancy TOR, the financial expert goes through the HCFC-141b purchase invoices to determine the baseline HCFC-141b consumption in the enterprise. The expert also checks the enterprise's bank transfer records, warehouse inventory, and other supporting documentation to verify its baseline consumption. Concurrently, a technical expert is responsible for analyzing and determining the HCFC-141b consumption for the last three years based on production data, while addressing any technical issues that may arise during the verification. The technical expert also helps evaluate whether HCFCs consumption is congruent with the enterprise's production capacity. After the verification team collects data on the enterprise's eligibility, baseline consumption and equipment, and other information pertinent to ExCom decision and the PIM, as well as photographs the manufacturing site and verification, all verification documents are copied and stamped by the enterprise.

47. The consumption verification results are reflected in financial and technical reports prepared by the team members respectively and submitted to FECO. FECO will in turn review and confirm the eligible funding in accordance with the PIM and ExCom decision.

ii. Commitment of subproject beneficiaries to permanently stop the use of HCFCs

48. After the baseline consumption is determined, the beneficiary enterprise drafts and submits an implementation plan illustrating its selection of HCFC-141b alternative technologies, conversion schedule, procurement plan, budget plus counterpart funding, and others. The implementation plan is evaluated and approved by the evaluation panel organized by FECO, with the participation of technical experts, safety experts, ISA and FECO. Particularly important to the sustainability of the conversion is a signed commitment letter by the enterprise to completely phase out HCFC-141b in addition to the SGA that FECO signs with each beneficiary enterprise. In both the SGA and commitment letter, there are provisions that maintain if the beneficiary enterprise fails to stop the use of HCFC-141b and/or continues to use other ODS already phased out, it would be a breach of contract. In such a case, FECO has the right to take actions against the beneficiary such as requiring it to immediately correct its breach and pay a breach penalty of up to 10% of the SGA's value, suspending further disbursement to the enterprise, or unilaterally terminating the SGA and requiring an immediate return of all subproject proceeds. There have been no breaches to date under the Stage I HPMP foam sector plan.

iii. Monitoring during subproject implementation to physical completion

49. Once the subgrant agreement is signed with the beneficiary enterprise, it will start conversion activities in line with the approved implementation plan, and apply for onsite verifications by the ISA, safety experts and selected accounting firm for certain technical and financial milestones that are specified in the SGA, for example, the completion of installation and trial runs of converted production lines, the physical completion, and the fulfillment of IOC. In addition, beneficiaries are required to submit on an annual basis from the time of SGA signing through subproject acceptance, HCFC-141b and alternative consumption amounts to FECO and ISA by email. This way FECO can monitor the gradual phase-out of the beneficiaries and report in semi-progress reports to the World Bank and annual programs to the ExCom.

50. After the beneficiary enterprise has completed the installation of new equipment for alternative technologies and completed the trial runs with the alternatives, the implementation support agency will conduct another on-site verification to check that the installed equipment is in line with the subproject's implementation plan, and the specifications in the procurement contract between the beneficiary and equipment supplier. If a discrepancy is detected during the verification, the ISA would require the beneficiary to submit to FECO explanations which may be supplemented by the ISA's justification from the technical perspective. The ISA also interviews the enterprise and goes through the documentation such

as production logs, raw material procurement invoices and other supporting documents to make sure that the beneficiary is operating well with the alternative technology. After the verification, the ISA shall include the findings in a verification report and submit to FECO. The ISA verification report is one of the milestones to trigger further disbursement to the beneficiary in accordance with the SGA.

51. After the beneficiary passed the ISA verification and disbursed over 90% of the funding, an independent consulting firm will conduct an onsite financial performance verification. This verification focuses more on the appropriate use of MLF grants and timely suspension of HCFC-141b use. The verification scope includes collecting HCFC-141b consumption and procurement information after SGA signature, the end point of purchasing HCFC-141b, and the data on exhausting all HCFC-141b stock at the enterprise. The firm also verifies the payment made to the equipment and raw material suppliers, disbursement records, purchase invoices, and disposal of baseline equipment (as an asset). The enterprise's financial records, including sales and production volume of the final products, as well as the sales contracts and the products based on alternatives are verified along with the documentation cited above. The financial verification confirms that the MLF grant allocated to the beneficiary has been used in accordance with the SGA and that the enterprise has fulfilled all its SGA obligations.

52. During the time of physical completion and awaiting the onsite verification, an enterprise that has converted to cyclo-pentane must notify local authorities for relevant approvals related to safety and environmental management.

iv. Subproject acceptance

53. After the beneficiary completes all the conversion activities, successfully adopts the alternative technology, passed the ISA onsite verification and financial performance verification, and gained the required approval from the local EEB and other authorities as required, the beneficiary may apply for subproject acceptance. In the application to FECO, the beneficiary also needs to provide its subproject completion report that specifies the phase-out impact, conversion milestones, annual HCFC-141b consumption during the implementation period, and consumption of alternatives, among others. FECO then organizes a commissioning team which is composed of local EEB officers, members from FECO and the ISA, and technical experts invited FECO who also serve to lead the commissioning team and who also will usually conduct the on-site acceptance. The commissioning team interviews the enterprise on its experiences, checks production with alternatives, and, goes through the verification reports, approvals from local authorities and other documents to make sure the beneficiary has completed all conversion activities without breaching the SGA. After internal discussion, the commissioning team announces that the beneficiary has passed the subproject acceptance, and then FECO will issue the certificate accordingly.

v. Post conversion

54. Once the beneficiary enterprise receives acceptance through FECO, the local EEB assumes responsibility of long-term monitoring of the enterprise's continued compliance with agreement provisions. FECO is to provide the list of enterprises that have completed conversions to relevant provincial EEBs, and provincial EEBs are to deliver the information to the local levels. Enterprises on the list can neither apply for HCFC-141b quota nor register HCFC-141b consumption at the provincial level. The EEBs are to include these enterprises in their monitoring and enforcement plans.

55. Aside regular EEB monitoring, all beneficiary enterprises are obliged to receive inspections from the World Bank as the IA. The World Bank inspections are done time to time at converted enterprises during the life of the overall project.

## D. Ensuring Sustainable Phase-out

### i. Institutionalized measures

56. The basis for longer-term, regular monitoring of foam enterprises in China using MP controlled substances is the 2013 circular under the ODS management regulations that establishes consumption quotas and registries. As explained in Chapter II, PU foam enterprises that consume over 100 MT of HCFC-141b annually are controlled at the national level by MEE and shall therefore apply in writing or through MEE's online system with supporting documents for an annual consumption quota before October 31 of the previous year. The MEE shall, in accordance with the annual production quotas of HCFCs and market need for HCFCs among different sectors, review the consumption quotas from the applicants before December 20th. If applying enterprise meets the requirements, MEE will issue the consumption quota licenses to enterprises meeting eligibility requirements while copying the relevant provincial EEBs. Similarly, if MEE rejects the application it will notify the applicant in writing why and request the applicant to register at provincial EEB.

57. Additional links between national and provincial level regulators are the notices and instructions sent by MEE for regional execution. A major instruction sent by MEE is the registration requirement of all HCFCs consumers across all sectors. PU foam enterprises with annual HCFC-141b consumption less than 100 MT must register consumption with supporting documents each year with the provincial EEBs which in turn conduct their review. HCFC consuming enterprises must keep relevant original data for more than three years for inspections (i.e. production logs, sales reports and invoices, financial statements, production operation records, accounts of main raw materials and products, and warehouse accounts).

### ii. Monitoring and enforcement actions

58. Following the roles and responsibilities described in Chapter II, the Atmospheric Environment Department of MEE is mandated to lead in ODS management and monitoring. It consequently develops general work plans, evaluates and executes policy actions on HCFCs, organizes training for national and local focal points and coordinates with other departments and agencies. The Department will also instruct the Enforcement Bureau to organize on-site inspections at ODS related enterprises and impose penalties in case of any violation detected. MEE's inspections and enforcement are usually for the most urgent or serious issues and high-risk areas.

59. Monitoring at the local level occurs through several channels. Local EEBs may be instructed through special national or provincial level notices to conduct special inspections of foam enterprises. As the institutional organization and mandates basically mirrors the MEE structure and functions at the national level, local EEBs will assemble similar teams for developing work plans, or to monitor or conduct inspections and enforcement actions. For instance, the atmospheric environment branch or other branch who owns the ODS management mandates usually takes the lead role, develops work plans and coordinates with other agencies. EEB's monitoring branches are involved to collect samples and test the components in the samples. The enforcement team is in charge of the on-site inspections, and punishes the enterprise that violates the regulations in accordance with the penalties specified in the ODS Management Regulation.

60. For HCFCs production and use, monitoring actions will therefore fall under (a) regular monitoring and inspections related to general pollution, and (b) special actions specifically targeting HCFCs and MP controlled substances.

61. Regular monitoring and inspections on general pollution issues by local (city/county/district level) EEBs starts with obtaining lists of enterprises primarily from EIA reports registered in the region. As the EIA identifies what type of environmental management rules that need to be followed, enterprises

established as HCFCs users will be included per the ODS management regulations. Local EEB inspectors focus on whether the production process is in line with the approved process, whether the raw materials used comply with the EIA and environmental regulations, and check on essential facilities that control air emissions, water effluents and waste management. The inspectors go through the production data and other documentation, as well as conduct visual inspection of the production line and warehouse. ODS use would be flagged even if the enterprise was not classified as an ODS user per the EIA. Samples are collected and tested by qualified institutions when inspectors are suspicious of a contravention. In case of being an HCFCs user, the enterprise would be punished with a fine of up to 500,000 yuan if it had not applied for a quota from MEE and did not register with the provincial EEB, or with a fine of up to 200,000 yuan if its HCFCs consumption exceeds the type, quantity, applications or term of validity in the issued quota or information registered on provincial level.

62. Special actions targeting HCFCs are also designed and implemented by provincial EEBs since the establishment of HCFC registration systems. A special action will first come up in a work plan targeting specific enterprises or sectors. For instance, a PU foam enterprise list will be compiled from registered HCFC-141b consuming foam enterprises and system houses, the list of MLF beneficiary enterprises provided by FECO, as well as the information collected from previous surveys and provided by industrial associations. Then monitoring actions will be conducted by provincial inspectors and local inspectors together. The inspectors will primarily look into the enterprise's compliance with issued quotas or registered information, and visually inspect the production data, purchase invoices and warehouse accounts. The inspectors may also take samples from production lines, final products, and raw material from the warehouse. The sample will be sealed with signatures and sent to qualified institutions to test the foam blowing agent.

**Implementation of MRV in Zhejiang Province**

*Organizational structure and legal basis*

A provincial ODS management leadership team has been established in the EEB in Zhejiang Province and is made up of the air and environmental management division, policy and regulation division, enforcement team, the public awareness and education division, and the monitoring and environmental centers. There are about 100 people involved in ODS management in the Province. The air and environmental management division is the lead for ODS management, which mirrors the same arrangement at the Ministry level.

The basis for all actions on ODS management, specifically HCFCs, is ODS management regulations and policies at national level, including the MEE regulation on HCFCs quota management. Provincial EEBs in turn interpret and execute them based on their local circumstances. The Zhejiang Provincial EEB accordingly issued an ODS regulation in 2017 that strengthens HCFCs production and consumption management. A series of notices were issued to each city and county level EEB under the new rules.

*Registry of HCFCs producers and consumers*

According to the regulation issued by Zhejiang EEB, all HCFCs producers and users across all sectors should be subject to the registration. The registry includes consumption levels as determined by invoices, sales, the application and subsector. All consumers must register regardless of the amount of HCFCs consumption. Sellers and distributors with sales of above 1 MT must also register.

An online registry has been created and put into use whereby all enterprises must log-in to register production, consumption, and sales (with supporting documentation) by the end of January of a given year. By 15 February the county level EEBs must complete the verification of uploaded documents and by the end of February, the city level EEBs will have registered enterprises. Information is subsequently publicly disclosed. If an enterprise has not registered in two years and is still producing or using HCFCs, it will be fined.

Under the first phase of the EEB capacity building activity in 2007, lists of HCFCs enterprises were already collected, and updated and revised on an ongoing basis. Local EEBs were informed that they must inform new enterprises of this registration system. So far, there are 246 companies registered in Zhejiang Province registry system. FECO has regular communication with local EEBs on the status of conversion sub-projects and it informs EEBs when such subprojects are completed, with the purpose to extending the list of enterprises to be monitored.

*Regular ODS monitoring and enforcement system in Zhejiang*

In Zhejiang, there are around 90 districts and county units and some regions have more enterprises than others so the average number of monitoring and enforcement officers is about five in less concentrated areas and 10-20 persons for more concentrated districts. These officials cover all environmental issues, not just HCFCs producing/using companies. There are inspectors at multiple levels; higher levels (MEE, Provincial EEB) can also do spot checks but this usually for the most urgent or serious issues and high-risk areas. And the regular monitoring and enforcement actions are usually taken place at city or county levels. The method of inspection includes checking production logs as well as financial records to cross check. Business licenses and other documents to prove the enterprise's legality will also be checked. Sample of products/raw materials are collected for testing when needed.

In the 2018, all 246 enterprises in the registry and completed conversion subprojects had been inspected. Zhejiang EEB incorporates monitoring and supervision in the regular monitoring. The local government will provide budget (against a work plan) to regular ODS monitoring and supervision, because it is now a provincial regulation. The regulation states inspection shall be done at least once a year.

## E. Stage I PU Foam Sector Plan TA

### i. Subsector HCFCs phase-out impact assessment

63. Technical assistance in the PU foam sector plan, enabled delivery of China's Stage I HCFC-141b phase-out strategy starting first with impact assessment on the industry first targeted. China Household Electrical Appliance Association (CHEAA) was selected to conduct an impact study on how the ban would affect the three targeted subsectors (reefer containers, refrigerators/freezers, and small appliances). Based on surveys, on-site interviews, information on HCFC-141b consumption, technical capacity for using alternatives, and cost impacts, the assessment concluded that banning HCFC-141b as blowing agent in the three subsectors was technically and economically feasible and would allow China to achieve its required HCFCs reductions. CHEAA proposed the draft ban to FECO.

### ii. Putting the subsector ban into place

64. Once the assessment and proposed ban were finalized, FECO provided them to MEE for approval. MEE paid high attention to the report and industry data, organized work meetings with sector experts and enterprise representatives, and forwarded the draft ban to all the relevant ministries, provincial EEBs, and industrial associations to solicit feedback. Hence the ban gained ownership by regulators at all levels and by the time it came into force in early 2019, local authorities could be ready to begin monitoring and enforcement of all enterprises in the subsectors, including those that did not receive MLF support.

### iii. Building capacity for provincial and local monitoring

65. Despite the progress and eventuality of national-level policies on quotas and registration as well as to ban HCFC-141b in the subsectors, it came to MEE and FECO's attention that some technical and capacity challenges remained on the ground, for example on the speed of creating registries per the 2013 rules, how

to differentiate alternatives from HCFCs, how to collect samples, and how and where blowing agent could be tested.

66. Therefore, in order to ensure sustainable phase-out of HCFC-141b and support building monitoring capacities at the local level, technical assistance and monitoring support were provided in 2018 to the Zhejiang, Guangdong, Qingdao, Shanghai, Liaoning and Jiangsu Provinces, where PU foam enterprises are highly concentrated. According to the TOR and work plan provided to contracted parties (at times research or monitoring institutions or other bodies within local ODS coordination groups), of the development of registries or lists of PU foam enterprises and system house companies in respective regions were accelerated or initiated as was necessary and supplemented. During the monitoring, relevant inspection teams have been required to conduct on-site visits to up to 30 PU foam enterprises and system houses per quarter depending on the regional enterprise population and budget. Samples of foam products and/or polyols must be collected during the visits. FECO provided 11 pieces of instant blowing agent detecting equipment to the teams to screen for the types of blowing agents. If ODS that was already phased-out is detected during the screening, the inspectors send the samples to certified institutions for lab testing and for a certified report. If the certified report indicates illegal ODS use by the enterprise, the evidence is provided to provincial EEBs and reported to FECO for legal and punitive actions.

67. The actions taken per the contracted TA will become absorbed and institutionalized by the provinces that have received the support for long-term monitoring, verification and enforcement. Several of the provincial EEBs have confirmed that a budget will be provided once the TA support is exhausted.

iv. Other TA activities to promote sustainable conversion

68. To promote the use of HCFC-141b alternatives in the larger PU foam industry, FECO has developed a number of TA, such as alternative studies in the panel and spray foam subsectors, and research on catalyst and stabilizers that are compatible with alternatives that may provide more solutions to different subsectors and different size companies. A safety standard on using HC technology in PU foam enterprises was developed and submitted to the relevant committee for review. The safety standard will guide enterprise management on using HC or HC pre-blended polyols as blowing agent in the sector and avert any inclination to resume use of non-flammable ODS.

69. Because SMEs in the PU foam sector lack information on alternatives and management capacity, they face more difficulties and challenges in selecting and using appropriate HCFCs-alternative technologies. A qualified institution was selected during Stage I to provide SMEs with technical training, consulting and onsite guidance. During the course of training and technical consultations, feedback and suggestions from enterprises and trainees was collected which will help FECO to plan and design phase-out activities in subsequent work plans. FECO also held workshops on ODS management policy, HPMP implementation, and development of alternative technologies each year during Stage I.

## F. Special ODS Law Enforcement Action

70. As of August 2018, on the basis of previous supervision and law enforcement, MEE has mobilized environmental authorities at provincial and municipal levels across the country to launch the latest ODS law enforcement action. MEE has emphasized its "zero tolerance" position towards illegal ODS related activities on various occasions. This enforcement action targeted, alleged sources of ODS by extensively collecting information and tracking down illegal production. In the process, it found and demolished two illegal CFC-11 production factories in Liaoning Province and Henan Province. On the spot, 177.6 tonnes of raw materials and 29.9 tonnes of illegally produced CFC-11 respectively were seized. The raw materials and CFCs were properly sealed, awaiting an accredited entity for disposal. Suspects were transferred to China's judicial organ for criminal prosecution. The action, also simultaneously targeted illegal ODS use

and as a result 1,172 related companies were investigated in China. Out of these investigations some CFC-11 traces in some batches of materials from 10 system houses, were detected. Local environmental authorities filed charges and exercised punishment to those involved in illegal use according to laws.

71. The enforcement action has demonstrated that with the revamping of control measures such as the 2013 rules requiring quota and registration for producers and users of HCFCs plus the 2015 amendments to the framework laws on environmental protection and air pollution control, there remain some incidences of illegal activity. Lessons drawn from and gaps identified during Stage I implementation and transfer of responsibility to local EEBs can more specifically assist FECO to maximize its influence through the MLF funded foam sector plans on the monitoring, verification and enforcement system, within its mandate. These are compiled in the following chapter.

## IV. Lessons Learnt

### A. Proven / best practices in monitoring and verification of consumption and phase-out

#### i. Third-party consumption verification

72. As indicated above, independent financial and technical consultants have been primarily responsible for the verifications during HPMP Stage I implementation. Introducing third-party verification, which is ensured by an open-competitive selection process, guarantees the independence of verification results. Moreover, because the third-party consultants were selected among other competitors, they were regarded as the most qualified to conduct the verification. Actual result from Stage I, namely the fact that all subprojects and grants delivered sustained HCFCs phase-out results, all in line with baseline information as well as with ExCom and PIM guidelines, confirms that the verifications were conducted with efficiency and integrity.

#### ii. Role of the mass-balance approach at enterprise and national levels

73. The mass-balance approach was adopted on two levels during Stage I HPMP implementation. Firstly, at the beneficiary enterprise level, the consultant used this approach to validate the baseline HCFC-141b consumption by comparing the ratio between MDI and HCFC-141b-based polyols. The data on foam production and HCFC-141b content per unit of product was also calculated for additional cross-checking. The performance verification after completion of conversion followed similar calculation procedures by comparing MDI, pre-blended polyols, and foam production data. This approach provides a reasonable way to determine the baseline, and would detect whether the beneficiary enterprise was using other blowing agents due to the different ratio of blowing agent contained in the polyol.

74. Secondly, the mass-balance approach also is useful to capture national level HCFC-141b that is consumed in PU rigid foam manufacturing. Unlike polyols that are produced and sold by hundreds of system house companies, MDI companies are limited in number allowing MDI used in PU rigid foam to be easily counted. The fixed ratio between MDI and polyols is known, as is the fixed percentage of HCFC-141b in polyols for different applications. Thus FECO, with assistance from sector experts, was able to derive HCFC-141b consumption as a cross-check with known annual HCFC-141b production figures. Any large deviation between the two figures would serve as an additional warning sign to any other type of monitoring activity that other foam blowing agents may be in use.

## B. Identified gaps and possible means to bolster enforcement capacity

75. Experience in implementing the PU foam sector plan under the Stage I HPMP that is coming to a close in June 2019 not only has helped to reinforce what works well in terms of ensuring sustainable phase-out, but also reveals some areas that could benefit from further attention.

76. *Testing Capacity to Facilitate Enforcement*. It was confirmed during regular EEB monitoring and during the 2018 enforcement action that there are currently only up to three institutions that can provide certified testing reports which are essential for enforcement and litigation against companies that violate China's ODS regulations. With development of a technical standard on testing blowing agent in foam with FECO's support in 2017, six more testing centers in key provinces are expected be able to adopt the standard and become certified PU foam blowing agent testing labs by the end of 2019.

77. *Tools and Equipment for Expanding Monitoring and Sampling Capacity*. During regular monitoring activities, foam and polyol samples are collected by local inspectors. It would be costly and time-consuming if all the samples were sent to testing centers. A blowing agent detector has become recently available in the market that has the proven ability to provide instant reports on the nature of the blowing agent in a sample of foam or polyols. In fact, the limited pieces that have been provided by FECO to eleven provinces and cities have significantly bolstered onsite monitoring capacity. Each provincial EEB and local EEB with a high concentration of PU foam enterprises should have at least 3-5 pieces of equipment to improve efficiency.

78. *Bolstering Enterprise Registries to include Former ODS-Users.* The local EEBs obtain lists of HCFC-141b consuming enterprises primarily based on the quota and registry information from MEE and provincial EEBs. However, the lists may not include the enterprises that have converted to non-HCFCs technologies or are under conversion. FECO has now provided the list of beneficiary enterprises that were converted under both the CFCs phase-out plan and HPMP Stage I in the PU foam sector to provincial EEBs, and recommends that the municipal level to more consistently improve PU foam enterprise data via EIA records and other channels to broaden the scope of monitoring for sustainable phase-out. Moreover, more follow-up from authorities at the provincial and national levels to ensure local EEBs make use of the lists, i.e. incorporate them into functioning registries may be needed.

79. *Fostering cross-regional cooperation and knowledge exchange.* Although training and work meetings are regularly organized within each province, experience and practice exchanges across regions/provinces have been insufficient. It is recommended that cross-regional workshops on monitoring experience in the PU foam sector and other sectors be held at least once a year. Officers from leading departments and enforcement teams from different provinces, sector experts, and officers from MEE and FECO shall be invited to discuss achievements and outcomes through enforcement action as well as monitoring obstacles.

# V. Proposed Methodology for Verifying Use of Phased-out Substances

80. The methodology currently in place under the Stage I HPMP for verifying the type and amount of HCFCs consumed at beneficiary enterprises and for monitoring their HCFCs phase-out up to hand-over to the local authorities has evolved over the years to a point where it is virtually impossible for parallel use of already phased out substances. Moreover, with the multiple project monitoring, verification and reporting measures, the continued technical support to enterprises during conversion, and the research and knowledge exchange on applying well-established alternatives (hydrocarbon and $CO_2$/water), the conversions are likely to be sustainable. Nonetheless, by assessing the approach described in the previous chapters,

observing on the ground results from the recent TA to the provinces and considering some of gaps previously laid out, the areas that could merit from more attention are those after hand-over by FECO. Although not directly the purview of the HPMP, an expanded methodology is proposed below to verify that ODS already phased-out have, are and will not be consumed at enterprises covered by the project. Most notably is to employ a wider, more systematic use of sampling in compliance monitoring. Several additional measures under the Stage II HPMP are also introduced to support the verification methodology post-project.

i. Subproject commissioning and handover

81. The Stage II HPMP will follow the same monitoring, verification and reporting mechanism as in Stage I, given that the activities are more or less the same. A new simplified implementation modality will be adopted for a subset of conversion at SMEs but onsite verification of consumption and monitoring of implementation will still continue at beneficiary SMEs. Meanwhile, additional measures and emphasis beyond the core activity of project implementation will be made primarily through technical assistance and proposed in the last section below as complementary to the proposed, expanded methodology.

82. As the national entity responsible for the overall coordination and implementation of the sector plans and implementation of conversion subprojects at foam enterprises, FECO should ensure that information exchange with local EEBs is maintained and even further strengthened, while verifying the sustainability of conversions where it still has authority. FECO will introduce the following measures:

- Once a conversion subproject is completed, relevant information on the beneficiary enterprise will be shared with the local EEB concerned for inclusion or update in the EEB's registry of enterprises.
- Data will be provided including but not limited to: enterprise contact information, completion date, substances phased out, type of products manufactured, and the alternative technology adopted.
- While the overall HPMP is still ongoing, FECO and/or the World Bank as the IA, will undertake random visits to **at least 10% of enterprises a year** that have converted one year prior or more.

ii. Integrated registry of past and present HCFCs-consuming enterprises

83. All compliance monitoring and enforcement activities require accurate, ongoing identification of the regulated users of HCFCs. The regulatory basis is there with registries required from MEE for producers, larger users and distributors and local EEBs for smaller companies.

84. The current registration systems in place with most local EEBs primarily contain information on enterprises that use and/or sell HCFCs. However, in order to have a means to ensure that there has been longer term, sustainable HCFCs phase-out, local EEBs will be encouraged to upgrade their existing registration systems, to also include previous users of HCFC-141b, i.e. to develop registries of foam manufacturers. The main sources of information will include:

- the list of enterprises with HCFCs consumption quotas and the list of registered HCFCs distributors provided by MEE;
- regular information on beneficiary enterprises provided by FECO;
- historical sectoral information provided by industrial associations;
- downstream client information shared by system houses in the region;
- business registration information shared by local administration for industry and commerce; and,
- internet searches, newspapers, advertising, "drive-by" surveys and other types of reconnaissance.

85. In addition, local EEBs will be required to assign personnel for data management and system maintenance, to cross check all relevant information in a timely manner, and to update the list of enterprises consumption/ ODS sales status. The inventory should facilitate tracking of changes in enterprise history

for instance graduation to a large user (above 100 MT) or vice versa, number of monitoring visits, dates and findings, and any non-compliance.

iii. Policy and planning for HCFCs compliance monitoring

86. Monitoring, inspection and enforcement is the joint effort of different departments under MEE, which is represented at the provincial and local levels with air and environment divisions or other division leading, given their ODS mandate. Local EEBs must develop and implement an approved compliance monitoring work plan that reflects state or provincial priorities as well as meets the requirements of air pollution and environmental rules (which would include ODS regulations); is effective in determining compliance with rules, standards and bans; and, provides representative monitoring data required by the provincial EEB and/or MEE. The work plan incorporates monitoring and enforcement at multiple levels and is developed based on the number and geographical distribution of enterprises in a region. More recently, with the special ODS investigation and the "look back" programs for environmental compliance, there have been special inspections and sampling.

87. Under this proposed expanded verification methodology, the work plans should now consistently include:

- enterprises in the foam sector that may have already stopped the use and/or sales of ODS blowing agents as well as those that still use and sell HCFC-141b products;
- a minimum threshold (frequency) of these enterprises to be visited in the reporting period; and,
- the type of monitoring (routine or on-demand, and consequently the required composition of the monitoring team and reporting requirements).

iv. Monitoring and enforcement

88. Compliance monitoring and enforcement work is conducted by the local EEBs. There will be a lead division/branch that has the ODS mandate in local EEBs. Monitoring consultants and officials from monitoring branches may participate in sampling and testing but only authorized/licensed enforcement officials are allowed to conduct inspections at an enterprise. There are also inspectors at multiple levels; the higher levels of MEE and provincial EEBs can also conduct spot checks, normally on the basis of "on demand" or special campaigns such as the ODS investigations of August 2018. To complete the loop of inspections and facilitate enforcement action, qualified institutions must be used for testing any samples collected.

89. *Regular and on-demand inspections*. In terms of the methodology, inspections of foam manufacturers and system houses will be similar to the technical and financial verifications done during subproject preparation and implementation involving physical inspection of manufacturing facilities, operation and storage areas; document review and interviews with key personnel. In accordance with current work rules for monitoring and enforcement, at least two licensed enforcement officers are required for each on-site inspection. They will check both the production logs as well as financial records for corroborating data. Business licenses and other documents to prove the enterprise legality will also be checked.

90. For better mainstreaming of ODS monitoring and for resource efficiency, this proposed methodology envisions:

- annual inspections on all PU foam enterprises and system houses in a given EEB jurisdiction.
- physical inspection, document review and interviews in all inspections.

91. It is important to note, that monitoring arrangements under the proposed methodology would entail additional costs, particularly for targeted inspections of foam blowing agent only. The indicative budget for regular inspections is estimated below.

***Table III. Estimated cost of one on-site visit to an enterprise (US$)***

| Item | Cost standards | Budget (US$) |
|---|---|---|
| Transportation | 100 US$/person, 2 persons | 200 |
| Accommodation | 150 US$/person, 2 persons | 300 |
| **Sub-total** | -- | **500** |

92. *Sampling at enterprises to determine compliance*. In both regular and on-demand inspections, sampling will be conducted using standard criteria that is adapted for specific regions to select which enterprises where sampling is required and frequency. Each EEB shall specify the sample collecting plan in the annual investigation plan. Inspectors will collect random samples from PU foam products, production lines or pre-blended polyol using standard procedures that are clear to the enterprise and that will permit high quality testing results. Each sample is required in triplicate for testing, with an estimated cost of US$450 per triplicate samples. The collected samples will undergo preliminarily testing onsite with specially designed instant foam blowing agent detectors. When samples result in positive results for banned and phased out ODS, they will be sent to qualified labs for further testing and certification.

93. The ability for inspectors to determine historical use of already phased out ODS is limited to the business practices at enterprises. Most foam companies produce on demand and will not carry stock of more than a year. In the rare cases that companies do have products or product samples reaching back several years, inspectors will be encouraged to take samples as their mandates permit and according to a sampling protocol or methodology.

94. *Third-part testing and enforcement*. In order to prosecute breaches of policy and regulations and impose punitive action, certified ODS samples taken on-site are required. Currently only up to three laboratories in China are qualified to do so. The estimated cost is US$120 per sample but what is more prohibitive is the time required until local EEBs receive results especially where they are located outside the province with the testing capacity. The effectiveness of monitoring action and consequently the sustainability of the phase-out is largely dependent on the potential punishment that an illegal producer or user will receive if caught. Having certified results defendable in court is therefore critical. The proposed action is to expand the number of qualified testing labs in China. MEE is establishing 6 testing centers including a national laboratory for ODS testing by the end of 2019 to enhance ODS testing capacity and provide legal support for enforcement actions.

95. In addition, to intensify punishment on illegal ODS production, MEE will strengthen cooperation with jurisdictional authorities to enable severe illegal ODS behaviors to be subject to punishment under Criminal Law. Punishment of various ODS illegal behaviors will be further intensified and deterrence force will be further enhanced.

v. Cross-regional cooperation and validation

96. *Joint Inspections.* The entire chain of PU foam production is complicated involving chemical suppliers, system houses, suppliers/distributors of raw materials and PU foam manufacturers. Knowledge is needed on the inputs to banned or regulated ODS as they may manifest themselves in various ways.

Furthermore, the geographical distribution of PU foam manufacturers and system houses is wide-spread across China. Nonetheless, during monitoring and enforcement, it is possible that local environmental enforcement authorities will trace back the source of raw materials for PU foam production to other administrative regions. In such cases, cross-regional collaboration for checking suspected players in the supply chain is needed. Local EEBs would report such a situation to MEE, and MEE will in turn coordinate across involved provinces to trigger a cross-regional verification and as required, enforcement action.

97. In addition, due to the more impactful means of enforcement with the Department of Public Security, and thereby leverage to ensure more effective and efficient law enforcement, local environmental enforcement authorities will more actively seek the cooperation of, and at times joint action with the local DPS to investigate the cases.

98. *Cross-regional inspections*. Some EEBs have pioneered a verification system whereby inspection teams from one municipality or county will be assigned random inspections in another jurisdiction to cross-check inspections from regular inspectors. This provides a type of "third-party" check and is important where regular inspections to enterprises may become routine and make it difficult to detect any or all deviations from regulations on the books.

vi. Enabling longer-term monitoring and verification

99. Considering the turnover and reposting of officials and enforcement staff, as well as local changes in the foam market from time to time, regular training on ODS compliance monitoring, verification and enforcement is required on a yearly basis. The proposal is to have at least one training workshop organized at the provincial level every year for each EEB, with the participation of local officials and enforcement staff from provincial, city and county levels.

***Table IV. Estimated cost of one training workshop for local officials & enforcement staff per province (US$)***

| Item | Cost standards | Budget (US$) |
|---|---|---|
| Consultant services | 180 US$/person, 6 persons | 1,080 |
| Meeting organization | The rate of the meeting room, meeting equipment, etc. | 1,300 |
| Document preparation | 5 US$/person, 150 persons | 750 |
| Accommodation | 80 US$/person, 150 persons | 12,000 |
| **Total** | -- | **15,130** |

100. The review of the system to monitor consumption of foam blowing agents under the Stage I HPMP as well as the past and more recent lessons learned in ensuring sustainable phase-out reveal a number of technical assistance activities that could be included in the Stage II PU foam sector plan. These activities would make it even more likely that conversions from Stage I were sustainable and build a more robust system outside of the project to help keep previously phased out ODS blowing agents from resurfacing over time. These include:

- Expand TA activities for strengthening registries and monitoring capacity at the local level to other key provinces, targeting first those implicated with some illegal ODS production and uses and/or having known foam manufacturing.
- Develop tools to facilitate monitoring, inspection, sampling and enforcement of ODS users and distributors, including:
    - **Inspection manual or module** (for integration in existing inspection manuals/procedures) specific to system houses and foam manufacturing;
    - **Foam product and polyol sampling protocol or methodology** for distribution/sharing among provinces;

    - **Develop a model online registration and tracking system** for HCFCs users, including those that have phased it out for adaptation/adoption by provincial and local EEBs;
- Continue to conduct technical research and demonstration of HCFCs alternative foam blowing agents.
- Conduct **annual mass balance analysis** soliciting MDI sales information and alternative consumption in the sector to cross-check with the national HCFC-141b production, determine market size, and verify whether additional foam blowing agent may be in the market.
- Support annual training workshops in provinces on the national level to level the knowledge and capacity for effective monitoring.
- Support MEE to facilitate cross-regional enforcement action, where it is not always clear in the supply chain who is responsible for illegal activity.

## Annex 1 –Agreement between the Executive Committee and China for the Reduction in Consumption of HCFCs: Key Decisions and Provisions related to the PU Foam Sector Plan

Executive Committee Decision 64/49 - Stage I of the HCFCs phase-out management plan for China

*(a) To acknowledge with deep appreciation the commendable efforts made by China towards the implementation of HCFCs phase-out activities in the polyurethane foam (PU), the extruded polystyrene foam (XPS), the industrial and commercial refrigeration (ICR), the refrigeration and air conditioning (RAC) and the servicing sectors to enable it to meet the 2013 and 2015 phase-out targets stipulated in the Montreal Protocol;*

*(b) To approve, in principle, stage I of the HCFCs phase-out management plan (HPMP) for China for the period 2011 to 2015 to reduce HCFCs consumption by 10 per cent of the baseline, at the amount of US$265,000,000 plus agency support costs for the Government of Germany, the Government of Japan, UNDP, UNEP, UNIDO and the World Bank, on the understanding that a maximum level of funding of up to US $5,000,000, plus agency support costs for UNDP, for the solvent sector could be considered at the 65$^{th}$ meeting;*

*(c) To note that the Government of China had agreed to establish as its starting point for sustained aggregate reduction an estimated baseline of 19,408.8 ODP tonnes, calculated using actual consumption of 18,602.7 ODP tonnes reported for 2009 under Article 7 of the Montreal Protocol, and estimated consumption of 20,215.0 ODP tonnes for 2010.*

Executive Committee Decision 67/20 – HCFCs Consumption Reduction Agreement

*(a) To approve the updated Agreement between the Government of China and the Executive Committee for the reduction in consumption of HCFCs submitted by UNDP, on behalf of the Government of China; and*

*(b) To note that the Fund Secretariat had updated paragraphs 1, 6 and 9 and Appendices 1-A, 2-A, 6-C and 6-D of the Agreement between the Government of China and the Executive Committee to reflect the newly established HCFCs baseline for compliance, the change in responsibility of co-operating agencies, and the now established agency support costs, and that a new paragraph 15 had been added to indicate that the updated Agreement superseded that reached at the 65th meeting and its revised Appendix 5-A approved at the 66th meeting, as shown in Annex X to the present report.*