الأمم المتحدة

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اللجنة التنفيذية للصندوق المتعدد الأطراف
لتنفيذ بروتوكول مونتريال
الاجتماع التاسع والسبعون
بانكوك، من 3 إلى 7 يوليه / تموز 2017

تقارير عن المشروعات التي لديها متطلبات إبلاغ معينة

1. تعرض هذه الوثيقة المشروعات ذات متطلبات إبلاغ محددة المطلوبة في الاجتماعات السابقة والتي تتطلب انتباه من اللجنة التنفيذية. وتتألف من الأجزاء التالية:

الجزء الأول: خطط إدارة إزالة المواد الهيدروكلوروفلوروكربونية / خطط إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية

الجزء الثاني: مشروعات التخلص من المواد المستنفدة للأوزون

الجزء الثالث: مشروعات تبريد المباني

الجزء الرابع: مشروعات أخرى.

2. ويحتوي كل جزء على تقرير مرحلي موجز، وتعليقات الأمانة وتوصياتها.

الجزء الأول: خطط إدارة إزالة المواد الهيدروكلوروفلوروكربونية / خطط إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية

3. من المقرر تقديم تقارير محددة إلى الاجتماع التاسع والسبعين عن المرحلة الأولى لخطط إدارة إزالة المواد الهيدروكلوروفلوروكربونية لأرمينيا[1]، وشيلي[2]، والصين[3]، وكوبا[4]، وإندونيسيا[5]، وجمهورية إيران الإسلامية[6]

[1] المقرر 41/77(هـ).
[2] المقرر 45/76(ب).
[3] المقرر 21/77(ج).
[4] المقرر 50/77(ب).
[5] المقرر 47/76(د).
[6] المقرر 43/74(هـ).

وفييت نام[7]؛ وعن المرحلة الأولى من خطة إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية للصين[8]. وقدمت التقارير لثلاثة بلدان فقط هي أرمينيا وشيلي والصين.

4. وقد ترغب اللجنة التنفيذية في أن تحث الوكالات المنفذة ذات الصلة على تقديم التقارير الواجبة إلى الاجتماع الثمانين عن المرحلة الأولى من خطط إدارة إزالة المواد الهيدروكلوروفلوروكربونية لكوبا، وإندونيسيا، وجمهورية إيران الإسلامية وفييت نام.

إعادة الأرصدة من بيع المعدات المشتراة لـSAGA في أرمينيا (اليونديبي)

معلومات أساسية

5. تضمنت المرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية الموافق عليها لأرمينيا[9] مشروعا استثماريا لتحويل تصنيع المبردات التجارية باستخدام الهيدروكلوروفلوروكربون-22 والهيدروكلوروفلوروكربون-141ب في شركة SAGA إلى المواد الهيدروكربونية. وتم إلغاء المشروع في الاجتماع الرابع والسبعين[10] لأن الشركة أعلنت إفلاسها بعد تسليم المعدات. وفي الاجتماع السابع والسبعين، طلبت اللجنة التنفيذية إلى اليونديبي الإبلاغ عن حالة بيع المعدات المشتراة لشركة SAGA في كل اجتماع إلى حين الانتهاء من بيع المعدات وتمت إعادة الأموال المحصول عليها من بيع المعدات إلى الصندوق المتعدد الأطراف.[11]

التعليقات

6. استلمت الأمانة تقريرا من اليونديبي يشير إلى أن بيع المعدات قد تم وأن رصيدا يبلغ 95,479 دولارا أمريكا من بيع المعدات سيتم إعادته إلى الصندوق المتعدد الأطراف في الاجتماع التاسع والسبعين.

التوصية

7. قد ترغب اللجنة التنفيذية في الإحاطة علما بإعادة الرصيد البالغ 95,479 دولارا أمريكيا من بيع المعدات المشتراة لـSAGA في إطار المرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية لأرمينيا.

<u>المرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية لشيلي (تقرير مرحلي سنوي) (اليونديبي)</u>

8. قدم اليونديبي، بوصفه الوكالة المنفذة الرئيسية، بالنيابة عن حكومة شيلي، إلى الاجتماع التاسع والسبعين تقريرا مرحليا سنويا عن تنفيذ برنامج العمل المرتبط بالشريحتين الرابعة والخامسة من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية[12] تمشيا مع المقرر 45/76(ب). ولم يقدم تقرير التحقق لعام 2015 لاستهلاك الهيدروكلوروفلوروكربون مع التقرير السنوي.

استهلاك الهيدروكلوروفلوروكربون

9. أبلغت حكومة شيلي عن استهلاك الهيدروكلوروفلوروكربون يبلغ 63.33 طنا من قدرات استنفاد الأوزون في عام 2016، وهو أقل بنسبة 20 في المائة عن هدف خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية البالغ 78.75 طنا من قدرات استنفاد الأوزون لعام 2016، وأقل بنسبة 27.5 في المائة من خط الأساس المحدد البالغ 87.5

[7] المقرر 49/76(ه).
[8] المقرران 66/77(ج)(2) و5/78(ج).
[9] المقرر 40/62.
[10] المقرر 23/74 والوثيقة UNEP/OzL.Pro/ExCom/74/20.
[11] المقرر 41/77(ه) والوثيقة UNEP/OzL.Pro/ExCom/77/35.
[12] تمت الموافقة على الشريحتين الرابعة والخامسة من المرحلة الأولى في الاجتماع السادس والسبعين بتكلفة إجمالية قدرها 291,225 دولارا أمريكية، تتألف من 199,299 دولارا أمريكيا، زائد تكاليف دعم الوكالة البالغة 14,947 دولارا أمريكية لليونديبي، ومبلغ 68,123 دولارا أمريكيا زائد تكاليف دعم الوكالة البالغة 8,856 دولارا أمريكية للأمم المتحدة للبيئة.

طنا من قدرات استنفاد الأوزون. وقدمت الحكومة أيضا بيانات استهلاك القطاع بموجب تقرير تنفيذ البرنامج القطري الذي يتسق مع البيانات المبلغ عنها بموجب المادة 7.

التقرير المرحلي عن تنفيذ الشريحتين الرابعة والخامسة من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية

10. واستمرت الحكومة في العمل نحو تعزيز نظام التراخيص للمواد المستنفدة للأوزون عن طريق تحديث المدونة الوطنية للجمارك لتشمل التعديلات على عناوين التعريفات وأوصاف للمواد الهيدروكلوروفلوروكربونية والمواد الهيدروفلوروكربونية، والمنتجات/المعدات التي تحتوي عليها. وحدثت هذه التغييرات منذ يناير/ كانون الثاني 2017.

قطاع خدمة التبريد

11. وتم تدريب ما مجموعه 290 من الفنيين في مجال الممارسات الجيدة للتبريد، بما في ذلك العمليات البديلة والمواد البديلة لاستخدام الهيدروكلوروفلوروكربون-141ب في الغسيل، مثل النتروجين، وفلتر امتزاز الأحكاض وتغييرات متتعدة للزيت (المكبس)؛ وتم ترخيص 162 من الفنيين؛ وتلقى 61 من الفنيين إعانات من خلال نظام دعم مالي لترخيص الفنيين، وتم تقييم 24 منهم على مهارات الخدمة استعدادا للترخيص النهائي؛ وتم التوقيع على اتفاق لمشروع إيضاحي بشأن استخدام ثاني أكسيد الكربون فوق الحرج في إثنين من السوبر ماركيت (أحدهما مدعوم من تجالي المناخ والهواء النظيف والآخر مدعوم من الصندوق المتعدد الأطراف)؛ وتم تعيين الشركة والخصائص التقنية للمعدات من أجل مركز الإصلاح ويجري الآن تنفيذ عملية الشراء وأعمال التركيب؛ وتم إعداد المبادئ التوجيهية لاسترداد وإعادة تدوير غازات التبريد، ويواصل تنفيذ أنشطة التوعية.

وحدة تنفيذ المشروع والرصد

12. ينفذ رصد المشروع وتنفيذه من خلال وحدة الأوزون الوطنية التي تستمر في العمل مع اللجنة الاستشارية لدعم تنفيذ أنشطة خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية عن طريق تنظيم اجتماعات استشارية مع أصحاب المصلحة؛ وزيارة محلات السوبر ماركيت لاستعراض التقدم المحرز في المشروعات الإيضاحية؛ والعمل مع الغرفة الشيلية للتبريد وتكييف الهواء لدعم عملية ترخيص الفنيين.

مستوى صرف الأموال

13. حتى فبراير/شباط 2016، ومن أصل مبلغ 1,786,455 دولار أمريكي تمت الموافقة عليه، تم صرف 934,640 دولارا أمريكيا (52.3 في المائة) (779,130 دولارا أمريكيا لليونديبي و155,510 دولارا أمريكية للأمم المتحدة للبيئة) على النحو المبين في الجدول 1.

الجدول 1. التقرير المالي عن المرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية لشيلي (دولارات أمريكية)

الوكالة	المبلغ الموافق عليه (دولار أمريكي)	المبلغ المنصرف (دولار أمريكي)	معدل الصرف (%)
اليونديبي	1,497,966	779,130	52.0
الأمم المتحدة للبيئة	288,489	155,510	53.9
المجموع	**1,786,455**	**934,640**	**52.3**

التعليقات

14. لاحظت الأمانة تقديم تقرير شامل يوضح التقدم المستمر المحرز بشأن الأنشطة في المرحبة الأولى من خطة إدارة إزالة المواد الهيدروكلوروكربونية. وتم الإبلاغ عن أن الأنشطة في قطاع الخدمة تسير في تقدم جيد، وأن المشروع الإيضاحي بشأن استخدام ثاني أكسيد الكربون الحرج للغاية في أثنين من محلات السوبر ماركيت سيؤثر

على هذا القطاع في تحويل محلاتهم في المستقبل. ووقد أدى تدريب وترخيص الفنيين إلى تنفيذ عددا من الأنشطة وبرنامج الترخيص يسير على الطريق ليصبح شرطا إلزاميا بمجرد أنشائه بالكامل.

15. ولاحظت الأمانة مع القلق أن تقرير التحقق لعام 2015 من استهلاك الهيدروكلوروفلوروكربون لم يتم تقديمه، وطلبت ردا من اليوئنديبي بشأن هذه المسألة. وأبلغ اليوئنديبي الأمانة بأن تقريرا التحقق لعامي 2015 و2016 بشأن الاستهلاك سيقدما في موعد أقصاه الاجتماع الثمانين.

16. ويستمر تنفيذ الأنشطة على النحو المقرر وبلغ المستوى العام للصرف ما نسبته 52 في المائة من التمويل الموافق عليه. وأكدت اليوئنديبي أن تاريخ الإنجازالتشغيلي للمرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية سيكون ديسمبر/ كانون الأول 2017، على النحو المتفق عليه في الاجتماع السادس والسبعين.

التوصية

17. قد ترغب اللجنة التنفيذية في:

(أ) الإحاطة علما بالتقرير المرحلي لعام 2016 عن تنفيذ خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية (المرحلة الأولى) لشيلي، المقدمة من اليوئنديبي؛

(ب) مطالبة اليوئنديبي بتقديم تحقق لعام 2015 و2016 لاستهلاك الهيدروكلوروفلوروكربون كجزء من المتطلبات للمرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية في موعد أقصاه الاجتماع الثمانين.

المرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية للصين (اليوئنديبي)

18. عملا بالفقرة 5(ب)(1) من الاتفاق المبرم بين حكومة الصين واللجنة التنفيذية لتخفيض استهلاك المواد الهيدروكلوروفلوروكربونية، أجري تحقق مستقل في عام 2016 بشأن تحويل خطوط التصنيع لوحدات تكييف الهواء الأحادية ومبردات المياه الصناعية والتجارية (المضخات الحرارية) من تكنولوجيا الهيدروكلوروفلوروكربون-22 إلى تكنولوجيا الهيدروفلوروكربون-32 في DunAn Environment في إطار خطة قطاع التبريد الصناعي والتجاري للمرحلة الأولى من خطة إدارة إزالة المواد الهيدروكلوروفلوروكربونية في الصين. وكشف التحقق عن أن DunAn Environment كانت تصنع وحدات تستخدم الهيدروفلوروكربون-410 ألف في أحد خطوط التصنيع التي تم تحويلها إلى تكنولوجيا الهيدروفلوروكربون-32 في غياب المعيار الوطني للسلامة لوحدات تكييف الهواء التي تستخدم غازات التبريد القابلة للاشتعال.

19. وفي الاجتماع السابع والسبعين، أبلغ اليوئنديبي اللجنة التنفيذية بأن DunAn Environment أوقفت تصنيع المعدات التي تستخدم غاز التبريد R-410A في الخطوط المحولة لتصنيع المعدات التي تستخدم الهيدروفلوروكربون-32. وبعد ذلك، طلبت اللجنة التنفيذية إلى اليوئنديبي أن يقدم رسالة من المؤسسة تنص على التزامها بصمان أن خطوط التصنيع التي يمولها الصندوق المتعدد الأطراف ستستمر في تصنيع المعدات باستخدام التكنولوجيا التي تمت الموافقة على تمويلها فقط (المقرر 21/77(ج)).

التعليقات

20. قدم اليوئنديبي رسالة من DunAn Environment مؤرخة 21 ديسمبر/كانون الأول 2016 تذكر أن جميع الخطوم المحولة إلى الهيدروفلوروكربون-32 لن تشترك في إنتاج معدات تكييف الهواء التي تستخدم المواد الهيدروكلوروفلوروكربونية، أو الهيدروفلوروكربون-410ألف أو أي غازات تبريد أخرى لها قيمة عالية من إمكانية الاحترار العالمي عن تلك الإمكانية للهيدروفلوروكربون-32. وبعد أن يسري مفعول المعيار الوطني للسلامة GB 9237 وأنه يسمح ببيع وحدات تكييف الهواء التي تستخدم الهيدروفلوروكربون-32، وأن الشركة

ستبذل أقصى الجهود للاشتراك في إنتاج معدات تكييف الهواء التي تستخدم الهيدروفلوروكربون-32 والتشجيع عليها؛ وأن الشركة تقبل أيضا رصد والتفتيش على موقع الإنتاج لامتثالها بهذا التعهد.

21. وبناء على طلب لمعلومات إضافية، أفاد اليونديبي أن الرصد الجاري للخطوط المحولة سيتم إجراؤه بواسطة المكتب المحلي لحماية البيئة كجزء من برنامج الرصد الروتيني، لضمان أن الشركة ستقوم بتصنيع المعدات التي تستخدم غاز التبريد الكلوروفلوروكربون-32 أو أي غاز تبريد آخر له إمكانية احترار عالمي منخفض عن الهيدروفلوروكربون-32.

التوصية

22. قد ترغب اللجنة التنفيذية في الإحاطة علما بخطاب الالتزام المقدم من شركة DunAn Environment من خلال اليونديبي لضمان أن خطوط التصنيع التي يمولها الصندوق المتعدد الأطراف ستستمر في تصنيع المعدات التي تستخدم التكنولوجيا التي تمت الموافقة على تمويلها عملا بالمقرر 21/72(ج).

المرحلة الأولى من خطة إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية في الصين (البنك الدولي)

23. أدرج النشاطان التاليان للمساعدة التقنية لتخفيض الآثار البيئية الضارة من انبعاثات المنتج الفرعي الهيدروفلوروكربون-023 في إطار المرحلة الأولى من خطة إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية في الصين:

(أ) التحقيق بشأن خفض معدل المنتج الفرعي الهيدروفلوروكربون-23 باستخدام أفضل الممارسات، لتخفيض معدل المنتج الفرعي الهيدروفلوروكربون-23 من خلال السياسات والتدابير التقنية؛

(ب) البحوث والدراسة بشأن تكنولوجيات تحويل/حرق الهيدروفلوروكربون-23 من أجل إيجاد حل أكثر فاعلية من حيث التكلفة للتخلص من الهيدروفلوروكربون-23.

24. وفي الاجتماعين السابع والسبعين والثامن والسبعين، طلبت اللجنة التنفيذية إلى حكومة الصين من خلال البنك الدولي أن تقدم إلى الاجتماع التاسع السبعين تقارير عن حالة الدراسات المذكورة أعلاه (المقرران 66/77(ج)(2) و5/78(ج)).

25. وفيما يتعلق بالدراسة بشأن تكنولوجيات تحويل/حرق الهيدروفلوروكربون-23، أشار البنك الدولي إلى أن شركة استشارية يتم اختيارها حاليا ومن المتوقع أن تبدأ العمل بحلول يونيه/ حزيران 2017. وسيستعرض الخبير الاستشاري الإطار السياسي الجاري ويوصي بتدابير تنظيمية لدعم خفض الانبعاثات من خلال أفضل الممارسات، وسيجمع البيانات ويستعرض عائد المنتج الفرعي الحالي، والخسائر في المواد الخام، والمنتجات الوسيطة والمنتجات النهائية، لتحديد الفرص لتحسين فاعلية العملية، وسيقدم مشورة تقنية تكون مناسبة لعملية الإنتاج الفردية لخفض معدل المنتج الفرعي الهيدروفلوروكربون-23 وسيقوم بتقييم الجدوى الاقتصادية للتدابير التقنية ويقدر تكاليفها.

26. وفيما يتعلق بالدراسة بشأن أفضل الممارسات في خفض معدل المنتج الفرعي الهيدروفلوروكربون-23، أشار البنك الدولي إلى أن العقد قد منح إلى مؤسسة لاستكشاف جدوى إعادة تدوير وإعادة استخدام الهيدروفلوروكربون-23 المولد من إنتاج الهيدروكلوروفلوروكربون-22، وأن الدراسة سيتم الانتهاء من إعدادها في سبتمبر/ أيلول 2017، وأن التقرير النهائي سيقدم بحلول نهاية عام 2017.

التعليقات

27. مع ملاحظة حالة تنفيذ أنشطة المساعدة التقنية وبعد المزيد من المناقشات، أشار البنك الدولي إلى أنه يمكن أن يقدم تحديثا آخر إلى الاجتماع التاسع والسبعين عن حالة العمل.

28. وقد ترغب اللجنة التنفيذية أيضا في الإحاطة علما بأن وصفا موجزا عن الممارسات الجارية لرصد الهيدروفلوروكربون-23 في إطار تنفيذ خطة إدارة إزالة إنتاج المواد الهيدروكلوروفلوروكربونية للصين قد تم إدراجه في الوثيقة بشأن الجوانب الرئيسية ذات الصلة بتكنولوجيات الرقابة على المنتج الفرعي الهيدروكلوروفلوروكربون.[13]

التوصية

29. قد ترغب اللجنة التنفيذية في:

(أ) الإحاطة علما بتقارير الحالة المقدمة من البنك الدولي عن أنشطة المساعدة التقنية بشأن تكنولوجيات تحويل/حرق الهيدروفلوروكربون-23 وعن التحقيق بشأن خفض معدل المنتج الفرعي الهيدروفلوروكربون-23 باستخدام أفضل الممارسات؛

(ب) مطالبة البنك الدولي بتقديم تقرير مرحلي إلى الاجتماع الثمانين عن حالة تنفيذ أنشطة المساعدة التقنية بشأن تكنولوجيات تحويل/حرق الهيدروفلوروكربون-23 ومشروع تقرير نهائي عن الدراسة بشأن التحقيق بشأن خفض معدل المنتج الفرعي الهيدروفلوروكربون-23 باستخدام أفضل الممارسات.

الجزء الثاني مشروعات التخلص من المواد المستنفدة للأوزون

30. في الاجتماع السابع والسبعين، طلبت اللجنة التنفيذية إلى الوطالات الثنائية والمنفذة أن تقدم، ابتداء من الاجتماع التاسع والسبعين والاستمرار في ذلك حتى إنجاز المشروعات، تقارير لجميع المشروعات الإيضاحية التجريبية للتخلص من المواد المستنفدة للأوزون بصفتها مشروعات ذات متطلبات إبلاغ محددة.[14]

معلومات أساسية

31. كانت اللجنة التنفيذية، منذ الاجتماعات الثامن والخمسين وحتى الثالث والسبعين، قد وافقت على تمويل 16 طلبا لإعداد المشروعات أدت إلى إعداد كامل لمشروعات إيضاحية تجريبية لإدارة نفايات المواد المستنفدة للأوزون والتخلص منها في 11 بلدا، ومشروعين إقليميين ومشروع للمساعدة التقنية بتمويل إجمالي قدره 11,278,052 دولار أمريكي على النحو المبين في الجدول 1. وتمت الموافقة على هذه المشروعات تمشيا مع المقرر 19/58، المبادئ التوجيهية المؤقتة لمشروعات التخلص من نفايات المواد المستنفدة للأوزون.

الجدول 1. الموافقات على المشروعات الإيضاحية للتخلص من المواد المستنفدة للأوزون

البلد	عنوان المشروع	الوكالة	الاجتماع	الأموال (دولار أمريكي)	الحالة
الجزائر	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	فرنسا	الثاني والسبعون	250,000	جاريا
		اليونيدو	الثاني والسبعون	375,059	جاريا
البرازيل	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليوئنديبي	الثاني والسبعون	1,490,600	جاريا
الصين	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليابان	السابع والستون	900,000	جاريا
		اليونيدو	السابع والستون	1,227,885	جاريا

[13] UNEP/OzL.Pro/ExCom/79/48.

[14] المقرر 8/77(ه)(1).

البلد	عنوان المشروع	الوكالة	الاجتماع	الأموال (دولار أمريكي)	الحالة
كولومبيا	مشروع إيضاحي بشأن إدارة نفايات المواد المستنفدة للأوزون وتدميرها في نهاية العمر الافتراضي للمعدات	اليونديبي	السادس والستون	1,195,000	جاريا
كوبا	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليونديبي	الثاني والستون	525,200	أنجز في أكتوبر/تشرين الأول 2015
جورجيا	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليونديبي	التاسع والستون	55,264	أنجز في ديسمبر/كانون الأول 2015
غانا	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليونديبي	الثالث والستون	198,000	أنجز في ديسمبر/كانون الأول 2016
لبنان	مشروع إيضاحي تجريبي بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها	اليونيدو	الثالث والسبعون	123,475	جاريا
المكسيك	مشروع إيضاحي بشأن التخلص من المواد المستنفدة للأوزون غير المرغوبة	فرنسا	الثالث والستون	500,000	جاريا
		اليونيدو	الثالث والستون	927,915	جاريا
نيجيريا	مشروع إيضاحي بشأن التخلص نفايات المواد المستنفدة للأوزون غير المرغوبة	اليونيدو	السابع والستون	911,724	جاريا
تركيا	مشروع إيضاحي بشأن التخلص نفايات المواد المستنفدة للأوزون غير المرغوبة	اليونيدو	السادس والستون	1,076,250	جاريا
إقليمي: الاتحاد الأوروبي	مشروع إيضاحي بشأن استراتيجية إقليمية لإدارة نفايات المواد المستنفدة للأوزون والتخلص منها في إقليم أوروبا ووآسيا الوسطى	اليونيب	التاسع والستون	75,000	جاريا
		اليونيدو	التاسع والستون	274,480	جاريا
نيبال	مشروع إيضاحي بشأن التخلص المواد المستنفدة للأوزون غير المرغوبة	اليونيب	التاسع والخمسون	157,200	أنجز

32. وتم إنجاز ثلاثة من هذه المشروعات التجريبية وقدمت التقارير النهائية من اليونديبي (لجورجيا وغانا) ومن الأمم المتحدة للبيئة (لنيبال) لإعلام اللجنة التنفيذية في الاجتماع التاسع والسبعين، على النحو الوارد إيجازه أدناه. وترد التقارير الكاملة في المرفق الأول بهذه الوثيقة.

<u>جورجيا: مشروع إيضاحي تجريبي لإدارة نفايات المواد المستنفدة للأوزون والتخلص منها (اليونديبي)</u>

33. تمثل الهدف من المشروع التجريبي لجورجيا في بيان كيفية التغلب على الحواجز لتدمير وإدارة المواد المستنفدة للأوزون غير المرغوبة من خلال أوجه التآزر بين مخزونات نفايات المواد المستنفدة للأوزون والمواد العضوية الثابتة، والتخلص من كمية قدرها 2.13 طن من نفايات المواد المستنفدة للأوزون غير المرغوبة التي تم جمعها بالفعل وتخزينها مؤقتا في مرافق في البلد.

34. وركز التقرير النهائي على الأنشطة التي أجريت بالمشاركة مع نقاط الاتصال، حيث تم التخلص المشترك من كلا تدفقي النفايات بطريقة مجدية من حيث التكلفة. وأعدت الصلاحيات ووثيقة عطاءات لعملية التخلص المشترك لتحديد المتعاقد من الباطن الذي يمكن أن يجمع ويغلف المواد العضوية الثابتة العتيقة ونفايات المواد المستنفدة للأوزون وينقلها إلى أحد مرافق التدمير في فرنسا. وتمت مراجعة الإطار السياسي بشأن إدارة النفايات الخطرة للنظر في نفايات المواد المستنفدة للأوزون والمواد العضوية الثابتة بطريقة شاملة.

35. وتمثل عامل رئيسي لنجاح المشروع في التنسيق الوثيق بين نشاطين تم تمويلهما على نحو منفصل، بدعم من الحكومة. وتبع ذلك إدارة مشتركة للمشروع من خلال عطاء واحد موحد، ومتعاقد من الباطن واحد وعملية واحدة لتصدير النفايات التي سمحت بالإجراءات مما أدى إلى وفورات شاملة. وبالإضافة إلى ذلك، فإن وجود تدفقات نفايات أصغر، سيستمر التخلص من نفايات المواد المستنفدة للأوزون في المستقبل يستفيد من التصدير المشترك مع نفايات المواد العضوية الثابتة، التي بموجب اتفاقية ستوكهولم هي التزام وطني بتدمير مثل هذه النفايات الخطرة. وأظهرت

الخبرة أن تنفيذ مثل هذه المشروعات المشتركة يستغرق وقتا أطول لإعداد وتحديد الشركات التي لديها خبرة في كل من النفايات. وقد سمح هذا المشروع بوضع مثل هذا النظام.

36. ونتج عن المشروع التدخلص من كمية من نفايات المواد المستنفدة للأوزون قدرها 1.2 طنا متريا، وهي كمية أقل من كان الكمية المستهدفة في الأصل. ويرجع ذلك إلى تدهور الخزانات التي تم تخزين المواد الكلوروفلوروكربونية فيها التي ربما أدت إلى تسرب في الغاز. وحدد المشروع جميع مصادر نفايات المواد المستنفدة للأوزون في البلد؛ ومع الدعم من التشريعات، سيستمر هذا التجميع في المستقبل.

37. وفيما يتعلق باستدامة المشروع، تقوم جورجيا في الوقت الراهن بإنشاء صندوق وطني للبيئة ليشمل الأموال المجمعة من الجزاءات المرتبطة بالتجارة غير المشروعة في المواد المستنفدة للأوزون. ولذلك يمكن استخدام هذا الصندوق للصادرات الإضافية من نفايات المواد المستنفدة للأوزون في المستقبل.

غانا: مشروع إيضاحي تجريبي لإدارة نفايات المواد المستنفدة للأوزون والتخلص منها (اليونديبي)

38. اقترح المشروع لغانا التخلص من كمية قدرها 1.8 أطنان من الكلوروفلوروكربون-12 التي تم جمعها بالفعل وكانت جاهزة للتدمير، ووضع تدابير لدعم استدامة المشروع من خلال النظر في النفايات المحتملة الأخرى من المواد المستنفدة للأوزون التي يمكن جمعها على الصعيد الوطني في إطار مشروع عن كفاءة الطاقة يموله مرفق البيئة العالمية.

39. وقدم التقرير النهائي تفاصيل عن تنفيذ المشروع، وشكل العمليات وبصفة خاصة أوجه التآزر بين المشروع الإيضاحي التجريبي والمشروع الذي يموله مرفق البيئة العالمية، وشراء المعدات (مثلا، ماكينات الاستعادة المتنقلة من ألمانيا، ومعدات المختبرات، ومحددات غازات التبريد، واسطوانات غازات التبريد)، ونتائج عملية التدمير. وأشار إلى تدمير ما مجموعه 1.2 طنا متريا من المواد الكلوروفلوروكربونية و5.2 طنا متريا من بروميد الميثيل من خلال مرفق في بولندا (Veolia)، وتم تصدير كمية إضافية قدرها طنا متريا من الكلوروفلوروكربون لتدميرها في مرفق في الولايات المتحدة الأمريكية (Tradewater). وبذلك، بلغ مجموع نفايات المواد المستنفدة للأوزون التي تم تدميرها 7.4 طنا متريا.

40. واشتملت بعض التحديات المواجهة خلال التنفيذ: الصعوبات في تجميع النفايات بكميات كافية للتدمير على نحو فعال من حيث التكلفة؛ وعدم استقرار أسواق الكربون الذي تبين أنه دافعا للاهتمام في التصدير لغرض التدمير؛ والعملية الداخلية للإفراج على تصدير خليط من النفايات إلى بولندا والولايات المتحدة الأمريكية (أي الملوثات العضوية الثابتة، وثنائي الفينيل متعدد الكلور والمواد المستنفدة للأوزون)؛ ومعالجة الأرصدة من الرغاوي التي تم جمعها والتي تحتوي على الكلوروفلوروكربون-11 وتدميرها.

41. ومن الدروس الرئيسية المستفادة من المشروع أهمية التعاون بين المشروعات ذات الطبيعة التكملية، وفي هذه الحالة نظام استبدال الأجهزة والخصومات الممول من مرفق البيئة العالمية والمشروع التجريبي لتدمير النفايات الممول من الصندوق المتعدد الأطراف. وبينما كان هذا النهج معقدا، فإن الجمع بين تدفقات النفايات هذه قدم حلا مجديا من حيث التكلفة للتدمير، مع وفورات في تكاليف النقل والتدمير. وقد أدى ذلك أيضا إلى التعاون بين هيئة الطاقة ووكالة حماية البيئة في غانا، وهما الوكالتان المسؤولتان عن مشروعات مرفق البيئة العالمية والصندوق المتعدد الأطراف، على التوالي.

نيبال: مشروع إيضاحي تجريبي لإدارة نفايات المواد المستنفدة للأوزون والتخلص منها (الأمم المتحدة للبيئة (يونيب))

42. سمح المشروع التجريبي في نيبال باستكشاف خيارين لتدمير 10 أطنان مترية من الكلوروفلوروكربون-12 التي تم جمعها وتخزينها من خلال وحدة الأوزون الوطنية. وتمثل النهج المختار في تصدير المواد المستنفدة للأوزون لتدميرها في الولايات المتحدة الأمريكية. وتم إنجاز ذلك من خلال سمسار، نظم نقل المواد المستنفدة للأوزون غير المرغوبة إلى مرفق تدمير مرخص. وتم تدمير الكمية البالغة 10 أطنان مترية (107,000 طنا من ثاني أكسيد

الكربون) في فبراير/ شباط 2013. وبالإضافة إلى ذلك، قُدم المشروع إلى CAR في مارس/آذار 2013 وورد بعد ذلك في CAR، واستوفى شروط التحقق النهائي من CAR، وصدرت أطنان CRTs.

43. وأدى المشروع إلى توليد 82,391 من تخفيضات الانبعاثات المتحقق منها، ومنها تم بيع كمية قدرها 22,000؛ وتم إيداع حصة البلد من البيع (12,925 دولارا أمريكيا) في حساب متفق عليه للمكتب الوطني للمعايير والمقاييس كأموال ستخصص للتدريب، وخلق الوظائف، وبناء القدرات وتطوير المجتمعات التي تركز على إدارة غازات التبريد، وكفاءة الطاقة والاستدامة البيئية.

44. وربط المشروع تدمير المواد المستنفدة للأوزون مع أسواق الكربون، واستكشف آليات مالية أخرى لدعم مشروعات التخلص من نفايات المواد المستنفدة للأوزون. وترد الدروس المستفادة من المشروع في التقرير النهائي المقدم.

التعليقات

45. عند استعراض كل تقرير، لاحظت الأمانة أن الجوانب التالية من المقرر 19/58 قد تم إدراجها في التقرير:

(أ) الكمية التقديرية للمواد المستفدة للأوزون التي تم تدميرها بالفعل من جانب المشروع؛

(ب) أوصاف نظم الجمع، وخصوصا في الحالات التي كانت مشروعات الصندوق المتعدد الأطراف في تآزر مع المشروعات الأخرى؛

(ج) الخطوات التفصيلية للعملية بأكملها؛

(د) التحديات الرئيسية المواجهة وكيفية التغلب عليها والدروس المستفادة حتى الوقت الحالي في تنفيذ المشروعات التجريبية.

التوصية

46. قد ترغب اللجنة التنفيذية:

(أ) أن تلاحظ مع التقدير التقارير النهائية عن المشروعات التجريبية بشأن إدارة نفايات المواد المستنفدة للأوزون والتخلص منها لغانا وجورجيا، المقدمة من اليونديبي، ولنيبال، المقدم من برنامج الأمم المتحدة للبيئة؛

(ب) دعوة الوكالات الثنائية والمنفذة إلى الأخذ في الحسبان، عند الاقتضاء، الدروس المستفادة من المشروعات الإيضاحية التجريبية للتخلص من المواد المستنفدة للأوزون المذكورة في الفقرة الفرعية (أ) أعلاه، عند تصميم وتنفيذ مشروعات مشابهة في المستقبل؛

(ج) مطالبة الوكالات الثنائية والمنفذة بتقديم التقارير النهائية لتلك المشروعات التجريبية الواجبة التقديم للتخلص من المواد المستنفدة للأوزون، وإعادة الأرصدة غير المنفقة إلى الاجتماع الثاني والثمانين للمشروعات التي لم تقدم تقارير عنها بعد إلى الاجتماع الثمانين أو الاجتماع الحادي والثمانين.

الجزء الثالث: مشروعات تبريد المباني

معلومات أساسية

47. في اجتماعها السابع والسبعين، طلبت اللجنة التنفيذية إلى الوكالات الثنائية والمنفذة، أن تقدم، ابتداء من الاجتماع التاسع والسبعين والاستمرار في ذلك حتى إنجاز المشروعات، تقارير لجميع مشروعات تبريد المباني الجارية بصفتها مشروعات ذات متطلبات إبلاغ معينة.[15] وفي الوقت الراهن، هناك أربعة مشروعات جارية لتبريد المباني؛ ويرد في الجدول 2 موجز لنتائج هذه المشروعات.

الجدول 2. تقارير الحالة عن المشروعات الجارية لتبريد المباني

البلد	عنوان المشروع	الوكالة	الاجتماع	الأموال الموافق عليها (دولار أمريكي)	تاريخ الإنجاز المقرر	حالة التقدم المحرز
البرازيل	مشروع إيضاحي للإدارة المتكاملة للقطاع الفرعي لتبريد المباني المركزي، يركز على تطبيق تكنولوجيات كفاءة الطاقة الخالية من الكلوروفلوروكربون لاستبدال المبردات التي تستخدم الكلوروفلوروكربون	اليونديبي	47	1,000,000	يناير/كانون الثاني 2017	حشد اليونديبي مبلغا وقدره 13.5 مليون دولار أمريكي من مرفق البيئة العالمية ومبلغا إضافيا قدره 64 مليون دولار أمريكي من التمويل المشترك. وقد أنجزت جميع الأنشطة الجوهرية في هذا المشروع. وتجري حاليا عملية طباعة المنشورات المتعلقة بالمشروع. ومن المقرر أن يغلق اليونديبي المشروع من الوجهة المالية بحلول نهاية عام 2017.
منطقة أفريقيا	مشروع إيضاحي استراتيجي للتحويل المعجل لتبريد المباني الذي يستخدم الكلوروفلوروكربون في خمس بلدان أفريقية (الكاميرون، ومصر، وناميبيا، ونيجيريا والسودان)	فرنسا	48	360,000	ديسمبر/كانون الأول 2017	من المتوقع الانتهاء فورا من تشغيل مبردات المباني في إطار المشروع بعد إعادة تهيئة المعدات في الربع الأخير من عام 2017. وبلغ الرصيد المتبقي 249,519 دولارا أمريكيا في نهاية ديسمبر/ كانون الأول 2016.
		اليابان	48	700,000	ديسمبر/كانون الأول 2017	
عالمي	مشروع عالمي لاستبدال أجهزة تبريد المباني	البنك الدولي للإنشاء والتعمير	47	6,884,612	ديسمبر/كانون الأول 2017	اشتمل المشروع الصين، والهند، وإندونيسيا، والأردن، وماليزيا، والفلبين وتونس؛ وترد حالة المشروع أدناه. **الأرجنتين**: خلال عام 2016، وقعت وحدة تنسيق المشروع، UEPRO، على اتفاق منحة فرعية مع - Fundación Favaloro Hospital Universitario y de Investigación Médica، لوحدتين من تبريد المباني بقدرة كل منها 350 طن تبريد (TR[16])، وواحدة أخرى مع اتحاد ملاك المباني لوحدة تبريد بقدرة 400 طن تبريد. وتم تدمير واحدة من وحدات التبريد بقدرة 350 طن التبريد والوحدة بقدرة 400 طن تبريد، بعد حجز الكلوروفلوروكربون، واستبدالهما في عام 2016. وتأجل استبدال الوحدة الأخرى لتبريد المباني بقدرة 350 أطنان تبريد إلى عام 2017 نظرا للتأخير في استلام المعدات ولأن تكييف الهواء كان ضروريا في فصل الصيف. وفي بداية عام 2017، بدأت وحدة تنسيق المشروع مناقشات حول استبدال وحدتين آخريين من وحدات تبريد المباني. وستدعو وحدة تنسيق المشروع إلى عطاء لمقترحات لاستبدال وحدات تبريد المباني في أبريل/نيسان 2017. **الهند**: أنجز المشروع في 31 ديسمبر/كانون الأول 2016؛ واستبدلت 34 وحدة تبريد مباني مع استعادة وتخزين حوالي 7 أطنان مترية من المواد الكلوروفلوروكربونية. وبلغت الطاقة اللازمة لتبريد قدرة 1 طن تبريد، 0.63 كيلوواط مقابل الهدف المقرر للمشروع البالغ 1 كيلوواط. **الأردن**: تم استبدال جميع وحدات تبريد المباني البالغ عددها 20 والتي تستخدم الكلوروفلوروكربون؛ وكان 15 منها مدعوما من خلال منحة جزئية من الصندوق المتعدد الأطراف؛ وتم استرداد كمية قدرها 4 أطنان مترية من الكلوروفلوروكربون وتخزينها في موقع حكومي إلى حين التخلص منها. وتراوحت وفورات الطاقة بين 17 و24.4 في المائة. **الفلبين**: أنجز المشروع في 31 ديسمبر/كانون الأول 2016؛ وتم استبدال 72 من وحدات تبريد المباني. **إندونيسيا**: ألغي المشروع نظرا لأن المشروع فشل في الحصول على تأييد من مرفق البيئة العالمية بسبب إمكانية استخدام غازات التبريد التي تحتوي على الهيدروفلوروكربون في استبدال وحدات تبريد المباني. ولم تتوافر المعلومات من المشروعات في الصين، وماليزيا وتونس ولذلك لم يتم الإبلاغ عن هذه المعلومات. وبلغ إجمالي الأموال المتعهد بها في إطار المشروعات المذكورة أعلاه 3,735,556 دولار أمريكي والوفورات المبلغ عنها 3,149,056 دولار أمريكي مع الأخذ في الحسبان المبالغ غير المخصصة لمشروعات تبريد المباني للصين وماليزيا وتونس، ومشروع فاعلية الطاقة لتبريد المباني في إندونيسيا والوفورات من مشروع الأردن.

[15] المقرر 8/77(ه)(2).

[16] يساوى الطن من التبريد حوالي 3.5 كيلوواط من قدرة التبريد.

التعليقات

48. لاحظت الأمانة إحراز تقدم في المشروعات الأربعة الجارية مع وجود بعض المشروعات في مراحل إنجاز متقدمة.

التوصية

49. قد ترغب اللجنة التنفيذية في إعادة التأكيد على المقرر 8/77(ه)(2) وتطلب إلى الوكالات الثنائية والمنفذة أن تقدم إلى الاجتماع الثمانين تقارير عن جميع المشروعات الجارية لتبريد المباني كمشروعات ذات متطلبات إبلاغ معينة؛ وتقديم تقارير إنجاز المشروع في موعد أقصاه يونيه/ حزيران 2018 وإعادة أرصدة الأموال في موعد أقصاه ديسمبر/ كانون الأول 2018.

الجزء الرابع: المشروعات الأخرى

50. تشمل التقارير المرحلية / المالية الأخرى بشأن المشروعات / الأنشطة التالية التي كانت واجبة التقديم ولكنها لم تقدم إلى الاجتماع التاسع والسبعين ما يلي:

(أ) دراسات جدوى استخدام تكنولوجيات من نوع آخر في ثلاثة بلدان[17]؛

(1) دراسة جدوى معالجة تبريد المناطق في بونتا كانا (اليوئنديبي)؛

(2) دراسة جدوى معالجة تبريد المناطق في مصر (الأمم المتحدة للبيئة واليونيدو)؛

(3) تحليل مقارن لثلاثة تكنولوجيات من نوع آخر للاستخدام في تكييف الهواء المركزي في الكويت (الأمم المتحدة للبيئة واليونيب)؛

(ب) خطة قطاعية إزالة إنتاج بروميد الميثيل في الصين (اليونيدو)؛[18]

(ج) مشروعات البحوث والتطوير التي نفذت بأموال من الصندوق المتعددة الأطراف في إطار قطاع إنتاج الكلوروفلوروكربون (البنك الدولي).[19]

التوصية

51. قد ترغب اللجنة التنفيذية في إعادة التأكيد على المقررات ذات الصلة الصادرة عن اللجنة التنفيذية وأن تحث الوكالات المنفذة على تقديم تقارير معينة إلى الاجتماع الثمانين عن:

(أ) دراسات جدوى استخدام تكنولوجيات من نوع آخر في الجمهورية الدومينيكية (بونتا كانا)، ومصر والكويت؛

(ب) خطة قطاعية إزالة إنتاج بروميد الميثيل في الصين؛

(ج) مشروعات البحوث والتطوير التي نفذت بأموال من الصندوق المتعددة الأطراف في إطار قطاع إنتاج الكلوروفلوروكربون (البنك الدولي).

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[17] المقرر 2/77(ه).
[18] المقرر 56/73.
[19] المقرر 26/77(ب).

Annex I

Pilot Demonstration Project on ODS- waste Management and Disposal in Georgia

Summary report

Prepared by NOU-Georgia and UNDP

May, 2017

GLOSSARY

CFCs - Chlorofluorocarbons

GARCAE - Georgian Association of Refrigerating, Cryogenic and Air Conditioning Engineers

GEF - Global Environment Facility

HCFCs - Hydrochlorofluorocarbons

LVC countries - Low-Volume Consuming countries

MLF –Multi-lateral Fund

MoENRP - Ministry of Environment and Natural Resources Protection of Georgia

NOU - National Ozone Unit

ODSs –Ozone Depleting Substances

PIU - Project Implementation Unit

POPs – Persistent Organic Pollutants

R&R - Recovery and Recycling Centers

UNDP - United Nations Development Programme

1. Introduction

The purpose of the Summary Report is to analyze the effectiveness of the Pilot Demonstration Project supported activities on ODS-Waste Management and Disposal in Georgia. The project was funded by the Multilateral Fund (MLF) for the Implementation of the Montreal Protocol and implemented by the United Nations Development Programme (UNDP).

The analysis of compliance of expected and achieved results is the main focus of the Summary Report with a special emphasis on cost-effectiveness of the selected joint project implementation modality.

The Summary Report is based on the data obtained during the implementation of the MLF/UNDP Pilot Demonstration Project on ODS-Waste Management and GEF/UNDP project "Disposal of POPs pesticides and initial steps for the containment of the dumped POPs pesticides in Georgia" (POPs project) documents and progress reports as well as required interviews with direct implementers of the programmes at UNDP-Georgia, the Project Implementation Unit (PIU), National Ozone Unit (NOU) and the Ministry of Environment and Natural Resources Protection of Georgia (MoENRP), and a selected sub-contractor waste management company (waste sub-contractor).

The Report also includes conclusions and recommendations for future similar activities which could be of interest to other countries in similar conditions.

2. Background

The Ozone Depleting Substances (ODSs) belong to a group of chemicals featuring ozone-layer reactions with resulting impacts on the environment and human health.

ODSs are not produced in Georgia and can only be obtained by import, which is regulated by the Government. The phase-out of the consumption of ODSs in Georgia was started after the country became the Party to the Montreal Protocol in 1996. As a result, over the last 15 years the decrease in the use of ODSs has been observed. Currently, Georgia consumes ODSs defined by the Montreal Protocol as temporarily allowed substances.

To address the national ODS phase-out commitments, since 1999 Georgia has implemented a number of activities aiming at reduction of the consumption of ODSs on one hand, and collection of unwanted ODSs on the other one. The decrease in the consumption of ODSs at national level was achieved through introducing stringent regulatory mechanisms and conducting a number of awareness raising, and capacity building and investment programs for Customs officers, technicians and the refrigeration servicing sector as a whole.

At the same time, the collection of the ODSs related waste started since 2003-2004 and over the period of 9 years 2,133 kg of ODSs had been collected in total (1,767 kg of CFCs and 366 kg of HCFCs). Two existing Recovery and Recycling (R&R) Centers and 15 small and medium enterprises in commercial/industrial/transport refrigeration sectors participated in this process.

Although the progress with respect to phasing out the use of ODSs as well as collecting the unwanted ODSs at national level has been tangible, the safe disposal and destruction of accumulated unwanted ODSs was a challenge for Georgia like the other Low-Volume Consuming (LVC) countries. To respond to the needs of the LVC countries, on request of the Twenty-First Meeting of the Parties to the Montreal Protocol, in 2011 the Executive Committee made a decision to set a funding window for ODSs waste destruction for LVC countries (Decision 63/5 (c)). This decision opened an opportunity for Georgia to get such financial support from the Multilateral Fund (MLF) for the Implementation of the Montreal Protocol in addressing this problem at national level.

Further to that, Georgia also faced a national problem of safe and sound disposal of obsolete pesticides of the Persistent Organic Pollutants (POPs) group, controlled under the Stockholm convention. In that respect, a number of GEF-funded and bilateral project activities were implemented during the recent years or are still ongoing in Georgia aiming at collection, safe disposal and destruction of abandoned obsolete POPs pesticides in the country. One of these projects was funded by GEF and implemented by UNDP which has been recently completed and originally aimed to prepare for export and disposal around 230 tons of obsolete POPs pesticides from the main Iagluja dumpsite.

With support of UNDP, the Government of Georgia prepared and, in April of 2013, submitted a project document to the MLF requesting funding for starting up a pilot project on destruction of collected unwanted ODSs in the estimated amount of 2,133 kg in a joint cooperative manner with the above mentioned GEF/UNDP POPs pesticides programme where both waste streams could be co-disposed to identify related cost-savings and report back to the MLF Secretariat on such achievements and lessons learned which could be of use to other LVC countries. No similar approach has been previously tested or applied by this type of MLF approved pilot projects. Besides that, the project aimed to develop an unwanted ODS waste collection and financial disposal scheme, expected to be generated in future in Georgia. In other words, the project focused on achieving the results in a most cost-effective way on one hand and developing sustainable mechanism for future disposal and handling of ODSs waste on the other one.

Project proposal was approved by the Executive Committee in 2013 and the budget of US$ 55,264 was allocated for its implementation during 2014-2015.

The actual project implementation started after it was endorsed by the Ministry of Environment and Natural Resources Protection (MoENRP) and UNDP in April 2014. The main beneficiary and the

implementing institution of the project is the MoENRP, acting through its established National Ozone Unit (NOU) which has carried out the project in close cooperation and with the technical support from UNDP.

3. Project implementation analysis

Two main objectives of the MLF/UNDP ODSs project were (i) to identify synergies and ensure cost-effective co-disposal (destruction) of 2,133 kg of collected unwanted ODSs in combination with the obsolete POPs pesticides under a parallel GEF/UNDP project; and (ii) to design the scheme for accessing and handling other unwanted ODSs in the country that can be generated in future.

Objective 1 - Cost-effective destruction of collected unwanted ODSs

Procedural activities

Currently, there are no special companies/facilities with necessary technical capacity and means for the national disposal of unwanted chlorinated ODSs wastes within Georgia, apart from cement kilns. The main reasons for that are (i) the lack of any regulatory mechanism requiring safe disposal and destruction of ODSs waste; (ii) the small amount of ODSs waste being generated throughout the country (Georgia belongs to LVC countries with small HCFC consumption); and (iii) the high capital costs needed to equip local cement kiln facilities with relevant technical means for waste disposal and emission controls, to be able to provide destruction services. Therefore, the only possibility for safe destruction of collected ODSs waste was to export it to the country with relevant capacities. Due to small amounts of collected ODSs waste of about 2 tons, the management, transportation abroad and destruction costs were expected to be also very high. Therefore, the co-disposal of the ODS wastes with the ongoing project GEF/UNDP POPs pesticides project was seen as a solution which could achieve a cost effective destruction of ODSs.

In order to achieve the final destruction of estimated 2,133 kg of unwanted ODSs it was necessary to prepare that ODS waste for export to qualified disposal facilities. The initial inventory of collected and temporarily stored unwanted ODSs located in various storage facilities throughout the country was carried out about 2 years before the actual project's start-up.

The project was supposed to be launched in 2012 after its approval by the 64th meeting of the Executive Committee in parallel to an ongoing GEF/UNDP POPs pesticides project. However, implementation of the project started only immediately after the project document's signature with the Government in April 2014 which was due to a new national project review procedure adopted by the Government of Georgia applied to all new international programmes.

In line with the project document the planned preparatory activities were aimed at transporting ODSs from different storages to the Georgian Refrigerant Recovery and Recycling Center in Tbilisi (capital); testing the composition by gas-chromatograph as the information on the ODSs composition was a necessary precondition before it could be accepted for destruction at qualified hazardous waste facility; and transferring the accumulated ODSs wastes in new containers meeting the modern safety standards as the waste gas was stored in deteriorating tanks to enable their further export.

With the purpose to implement the abovementioned tasks and prepare ODS wastes for exporting, UNDP concluded a contract with the Georgian Association of Refrigerating, Cryogenic and Air Conditioning Engineers (GARCAE). This organization unites more than 200 members from the service sector throughout the country and has over 15 years of experience in addressing ODSs related challenges at the national level, and plays an important role in promoting new internationally accepted standards and practices in this sector in Georgia. The agreement included specific activities to be implemented by GARCAE to support the project.

For the waste co-disposal purposes, a consolidated Terms of Reference (ToR) was elaborated in the framework of the GEF/UNDP POPs pesticides disposal project with the assistance of an international expert who was then hired and was assisting in parallel the MLF/UNDP ODS waste project.

Prior to announcing the joint international tender for the disposal of the POPs pesticides and ODS waste gas, a market research was conducted to identify experienced and internationally based hazardous waste management companies. All those interested companies which were identified were then invited to participate in the tender commissioned in August 2013. Four such international service providers had expressed the willingness to participate in the consolidated tender and were invited to a pre-bid conference. Based on tender results, a waste subcontractor was selected to excavate and repack obsolete POPs pesticides under the parallel GEF/POPs programme and transport them abroad along with the ODS waste gas to specialized hazardous waste destruction facilities in the EU.

Implementation activities

Under circumstances with lacking legal obligations on safe handling and storage of ODSs waste, it was important to re-confirm the previously reported inventory of ODS waste.

While conducting the complementary inventory of the already collected unwanted ODSs, GARCAE found out that instead of recorded 2,133 kg of ODSs, only 1,050 kg were remaining in stock at the Kutaisi Regional Recycling Center and the Georgian Refrigerant Recovery and Recycling Center in Tbilisi. This discrepancy in the amount may be explained by the absence of legal regulations and lack

of technical capacities (such as containment tanks of sufficient size) for storing such unwanted ODSs. Therefore, part of ODSs waste stock most probably ventilated out due to deteriorated condition of aging gas cylinders where part of those simply might have been lost due to mishandling.

In order to ensure safe storage and transportation of the ODS waste gas from the Kutaisi R&R center to Tbilisi, as well as preparation of the whole amount of the collected ODS waste for transportation abroad and final disposal , GARCAE had purchased two new containers fitting this purpose. The ODS waste was transferred into the new large capacity cylinders and the composition of ODSs was tested by means of the gas chromatograph, purchased previously in 2008 under other Montreal Protocol programmes, and then calibrated in the scope of the ODS pilot demonstration project to ensure proper readings of the ODS waste gas content.

Despite the initial perceived shortage of ODS waste gas as compared to the original project's targets, further, during the project's implementation period, some mislabeled ODS containing substances were identified and confiscated by Customs, and placed for storage in the Georgian Refrigerant Recovery and Recycling Center in Tbilisi. In total, more than 400 kg of additional unwanted ODSs waste from the Customs' confiscate was added to the re-confirmed 1,050 kg of ODSs for final disposal.

Finally, all ODS waste from the Kutaisi Recycling Center, the Georgian Refrigerant Recovery and Recycling Center in Tbilisi and the newly detected mislabeled substance, which was identified as the blend of HCFC-22, CFC-12 and HFC-134 (and not HFC-134a as it was labeled), amounting to 1,467 kg, were transferred into two new containers (750 kg and 717 kg charge capacity each respectively) and prepared for the Basel convention's export and transit procedures. All these activities were carried out by GARCAE in line with approved work plans.

For sustainability purposes, as part of its assignment, GARCAE organized trainings of staff responsible for the operation of gas-chromatograph in the Georgian Refrigerant Recovery and Recycling Center. Two technicians have been trained in gas-chromatography related operational processes as well as in the design and functional capacities of this SRI 8610C model. The training course included both theoretical and practical exercises.

All preparatory activities were completed by end of April, 2014. As a result, the ODS waste gas was sent in two cylinders to a dedicated disposal facility in France. All required export and transit documentation were obtained by the waste sub-contractor with assistance from the Government.

Exporting procedures and activities have been synchronized between these two GEF/UNDP POPs and MLF/UNDP ODS waste projects, and demonstrated a good level of cooperation in one lead

implementing agency - UNDP. Such practical experience at the national level equipped the Government with strengthened skills for future hazardous waste disposal operations for these two waste streams, and specifically the ODS waste gas in particular.

The table below summarizes all planned and implemented steps as outlined in sub-contracts with GARCAE and the waste sub-contractor.

Table 1. Activities undertaken by GARCAE and waste sub-contractor

Activity	Implementer	Status of implementation
Conduct complementary inventory and verification of ODS wastes originally listed in the Pilot Demonstration Project	GARCAE	**Done on time** 1,050 kg identified instead of original estimate of 2,133 kg
Purchase of two ISO containers and ancillary equipment for the ODS waste aggregation	GARCAE	**Done on time** Two containers purchased
Transport already collected ODS waste to the R&R Centre in Tbilisi	GARCAE	**Done on time**
Calibrate the gas chromatograph	GARCAE	**Done on time**
Train staff responsible for gas - chromatograph operating	GARCAE	**Done on time** 2 R&R technicians trained
Transfer collected ODS from the old containers to the newly purchased containers and test them by gas-chromatograph	GARCAE	**Done on time** 2 new containers were filled in with ODSs
Formulate a national scheme for accessing other unwanted ODSs (about 0.5 tons annually)	GARCAE	**Done on time** Draft provided to NOU
Excavate POPs pesticides from Iagluja Dumpsite	Sub-contractor	**Done on time**
Repack the excavated 230 tons of pesticides into safe packaging ready for export	Sub-contractor	**Done with a short delay due to weather conditions**
Transport prepared ODSs and POPs abroad for safe disposal	Sub-contractor	**Done on time** Exported to France and to Belgium

Cost Savings - At the project preparation stage, it was planned that the new demonstration MLF/UNDP project may benefit from coordinating its activities with the GEF/UNDP POPs pesticides disposal project that was already starting during that time. Specifically, savings were achieved through cost sharing, or, in other words, with minimal expenses induced to the MLF/UNDP ODS waste project: in the revision of legislative frameworks related to hazardous waste management, procedural implementation of one joint tender process for waste disposal, joint launch of waste export notification through the governmental departments, handling the wastes by selected waste management company and taking awareness raising measures on health and environmental risks posed by hazardous wastes.

According to estimates provided by the waste sub-contractor (see the Table 2 below), the cost saving from the joint implementation of the ODS waste project together with the POPs waste project is estimated to be US$ 9,000 and these savings relate only to the sub-contractor's (international) part of work.

Table 2. Estimated costs savings[1]

Cost item (USD)	Est. costs $ for POPs (230 tones) as if only POPs	Est. costs $ for ODS (~1,5 tones) as if only ODSs	Joint implementation est. costs $ (POPs/ ODSs)	Est. savings for MLF project
Preparation during Tendering	3,000	1,500	3,070	1,430
Participation to the inception workshop	3,000	1,000	3,070	930
Equipment Delivery	44,000	-	44,000	0
On site Repackaging Works	59,000	-	59,000	0
Inland Transportation	23,200	1,500	23,560	1,140
Maritime Transportation	82,000	5,400	82,900	4,500
Disposal	252,000	5,900	257,900	0
Management cost by sub-contractor (insurance, license, travel, off site personnel etc)	47,200	2,500	48,700	1,000
TOTAL	**513,400**	**17,800**	**522,200**	**9,000**

At the same time, if looked at from a perspective of national level's savings, the following Table 3, based on financial expenditure data, indicates overall savings in the amount of US$ 20,800.

Such detailed break-down by activity, based planned and real costs, as well as savings, is provided below in the Table 3.

[1] Line-Activity 6 of Table 3 where data is more accurate as coming from a financial system

Table 3. Project savings by activity

Activity type	Planned Costs US$ (2 ton of ODS)	Actual Costs $US (1,5 tons of ODS[2])	Savings
1.Purchasing two ISO container (950 kg each) and ancillary equipment	6,000	4,000[3]	2,000
2.Inception workshop for stakeholders involved in ODSs destruction	2,500	2,000	500
3.Transportation of ODSs from different locations to a centralized location in Tbilisi (16 locations)	3,200	3,000	200
4.Aggregation, calibration/certification of gas-chromatograph, and testing of the stocks before export	5,000	5,000	0
5.Training of staff and technicians	2,000	2,000	0
6. Transportation abroad and actual destruction incl. inland and maritime transportation, participation in the inception workshop, and management and logistics costs of sub-contractor, as per the Table 2)	17,564	8,800	8,764
7. Project management (part time 25% - 24 months times US$ 500/month)	12,000	6,664	5,336
8. Pilot project summary report preparation and, printing costs	7,000	3,000	4,000
Grand total	**55,264**	**34,464**	**20,800**

As visible from Table 3, some savings were achieved **in activities 6, 7 and 8** as a direct result of the joint tendering procedure for co-disposal of ODS and POPs waste, joint management of these two projects as well as savings during the final assessment report preparation stage.

Also it needs to be indicated that the ISO containers were purchased with the lowest price – US$ 1,000 / per tank. These containers and the ancillary equipment were purchased by the GARCAE from China under a contract with UNDP. Based on the information from the waste sub-contractor on the costs of this equipment return from France at a cost of US$ 3,500, the containers were not requested

[2] As it was mentioned in the paragraph ***Implementation activities,*** in the scope of the demonstration project 1.5 tons of ODSs were collected, exported and distracted in the framework of the project.

[3] From the indicated US$ 4000, US$ 2,000 was spent for the ancillary equipment and US$ 2,000 for two new containment cylinders (US$ 1000 for each container).

for shipment back to Georgia after the operation on ODS waste destruction was completed as it is more cost-effective to purchase new such tanks next time.

Other savings were made through the cost sharing because of joint management of these two projects.

As per the table 3, after implementation of the project, the costs for the transportation and destruction is US$ 5,800 for 1 ton of ODS waste gas which is, according to the waste sub-contractor, double the average costs for 1 tons of POPs pesticides.

Further, based on feedback from the sub-contractor, the management costs for a low quantity of ODSs or any other hazardous waste is usually quite high as it includes both transportation costs in individual sea-freight containers[4] and export/transit/import transactions (Basel Convention permitting) for a given low quantity of wastes with same amount of effort as for a larger cargo. Other related costs, like travel and accommodation cost of the sub-contractor, local transportation, personnel supervision, additional sub-contracting of certified personnel from abroad to handle gaseous substances as well as export and port handling fees would have to be considered case-by-case and would relate to the split of responsibilities with local partners. All these would make the destruction of such a small quantity of the collected ODS waste much more expensive.

In this particular case, according to the contract conditions, the sub-contractor had the responsibility only for the export and destruction of the ODS waste. Other activities connected with ODS waste's preparation for the export procedures were handled by GARCAE, which in terms of the cost and time saving was considered a better option. As said, the value of the contract would have been much higher if all required activities would have been implemented solely by the sub-contractor, therefore bringing the average ODS waste disposal substantially higher than the currently reported figures.

After the detailed analyses of the ODS project implementation, it should be emphasized as a conclusion that the joint implementation of these two projects (MLF/UNDP and GEF/UNDP) proved the feasibility of relatively sizeable cost-savings despite small scale.

Objective 2 – Development of scheme for handling unwanted ODSs

The second important objective of the project was to develop a sustainability scheme for collection and destruction of ODSs expected to be accumulated in Georgia in future. Specifically, it was planned to develop the scheme for accessing other unwanted ODSs and proposing financially sustainable

[4] Hazardous waste cannot be transported with other cargo, which means that higher costs for a whole 20/40 foot container would be necessary.

scenarios for their destruction in Georgia. The scheme was also based on experience acquainted in GARCAE. Development of such a system was scheduled as one of GARCAE's assignments under the main contract under this project with UNDP (see Table 1).

GARCAE formulated and submitted a draft scheme within the planned implementation timeframes. The scheme development methodology included a study on the ODS wastes generation and accumulation rates, interviews with key end-users on these respective matters, and analysis of existing national regulatory framework controlling ODS waste management as well as existing technological capacities for ODSs waste destruction, locally and internationally, and best international practices as applicable. The draft scheme was prepared in close collaboration with NOU and MoENRP and a number of meetings were held with the relevant stakeholders during its drafting and consultation processes.

While developing the scheme, GARCAE identified all major sources of ODSs waste generation, specifically listed below:

- Refrigerant Recovery and Recycling Centers,
- Service centers providing services to the air conditioning and refrigerator equipment (around 50 such centers),
- Importers and vendors of the refrigerants,
- Scrap metal collecting services as well as
- End-users who do not use CFCs any more but still keeping CFC12 in old containers in storages.

Based on information from the above mentioned potential ODS waste generating facilities, it was reconfirmed that about 500 kg of unwanted ODSs can be accumulated annually in Georgia if the adequate legislation requiring that and technical storage capacity is in place.

To ensure the financial sustainability of ODSs waste's destruction process, the draft scheme proposes three scenarios based on international expertise and national practice:

1. Imposing/use fees for importers/users of refrigerants to be paid to the state budget which would then be allocated for disposal operations of the accumulated wastes via the Ministry of Environment from the central budget.

2. Introducing incentive mechanisms through the taxation policy, encouraging companies to become "greener" improve equipment maintenance practices, reduce refrigerant leakages/emissions, and ensure waste minimization which will all be supported by certain legal improvements with monitoring mechanisms on compliance. In this case, a "softer"

taxation policy would be applied to those companies which cover the costs of disposal of unwanted ODSs. This difference between the regular tax and reduced tax would be accumulated in the state budget, and then made available to the Ministry of Environment for handling ODS waste disposal in future.

3. Establishing a special fund, voluntarily uniting all companies operating in this sector. A governing board will be created and attached to the operations of this fund, and the fund will be capitalized by the participating companies to cover the costs of ODS waste management and disposal.

According to the draft scheme, Option 3 was found to be more feasible and streamlined as it will require the least interventions from the state side into the private sector activities, and is more convenient for both private companies and the Government to operate to address project opportunities and requirements under the Montreal Protocol.

It also defines how the ODSs destruction can be achieved at national level, which will save transportation costs for the ODSs to be exported for destruction. Cement plants, with possible need of modernization, are identified as potential facilities for the ODSs waste destruction in Georgia.

4. Conclusions and recommendations

Based on review of the projects' related documents, reports and interviews with the main beneficiaries of the GEF/UNDP POPs and MLF/UNDP ODSs projects, it can be concluded that the implementation of the Demonstration Project on ODS-Waste Management and Disposal in Georgia is a great success as it has achieved its major objective – ODS waste co-disposal along with POPs wastes. Specifically, synergies between the MLF/UNDP ODS waste and GEF/UNDP POPs projects were demonstrated as possible and a cost-effective destruction of unwanted ODSs was achieved via the co-disposal with POPs materials. The project also assisted the Government and the NOU in formulating a draft national scheme for facilitating future collection and handling of ODSs waste and therefore, sustainability of ODSs management process in Georgia. This draft scheme was shared with the NOU.

Close coordination between the two projects, NOU, MoENRP and other participating partners, coherent implementation of exporting activities and joint management of the projects can be emphasized as key factors for the success of the MLF/UNDP ODS waste management project. The joint management of these two projects, one consolidated tender, one sub-contractor and related local and international waste export/transit/import permitting procedures resulted in certain savings of US$ 20,800 compared to the originally approved budget.

Being smaller in scope and the amount of work as compared to the GEF/UNDP POPs programme, the MLF/UNDP ODS wastes project had benefited much more in terms of savings and has also demonstrated practical feasibility and rationale of this approach, as well as contributed to better communication between these two focal areas in a Government setting as other waste management departments were involved in the ozone-related work.

The project's achievements is a proof that two different funding mechanism (GEF and MLF) can collaborate in a financially transparent and mutually beneficial manner if project planning/approval cycles can be aligned to the extent possible – e.g. if the GEF regularly funds POPs disposal programmes in ongoing 4-year cycles, then the MLF in matters not required for compliance such the ODS waste management operates on the basis of funding windows, and the selection of future project countries would much depend on planned or ongoing GEF/POPs programmes in those countries. Further, successful implementation of this pilot project has demonstrated the effectiveness of the selected project operation modality and can be replicated in other LVC countries which, what is also important to note, have access to sea routes for the export of wastes, as land-locked countries might experience waste transit issues.

It is also recommended to disseminate the information about implemented activities and share lessons learnt with other countries in the region to encourage and facilitate replication of the applied

synergistic approach in case there are any ongoing activities regarding export/destruction of POPs and/or other relevant hazardous waste.

Referring to the experience gained through the synergetic implementation of GEF/UNDP POPs and MLF/UNDP ODSs projects, it is also recommended to pay due attention to the following points while replicating this approach in other LVC countries:

- Time constraints should be considered in announcing the consolidated tender as procedures for the preparation of the consolidated international tender may take more effort and have longer advertisement times to attract suitable and qualified sub-contractors;

- Preliminary market research is important as it will facilitate identification of the companies with the robust experience in POPs and ODSs management;

- Close cooperation with the Ministry of Environment or/and other relevant public authorities is essential for the implementation of planned synchronized activities in a timely manner.

5. Further project's activities.

Considering the importance of the issue, as well as primary objective of funds allocated by MLF for Georgia, in further consultations with the Government and stakeholders it was recommended to capitalize on current achievements and attempt to maximize the project's benefits to the country in the following manner:

- Prepare a survey and composition tests (via the GC approach) of other unwanted ODSs identified and also those reported by the Ministry of Agriculture of Georgia[5];

- Explore technical opportunities for destruction of unwanted ODS within the country through conducting detailed feasibility study identifying existing technical capacities, legal requirements, willingness of the existing potential facilities to invest in gas feed mechanisms, expensive air pollution control (APC) and ash residue monitoring equipment, national laboratory capabilities for environmental monitoring etc.;

- Purchase two containers for the Recovery and Recycling Centers for future collection and safe disposal of unwanted ODSs.

[5] While preparing the Summary Report, in the framework of the interview with the NOU, it was revealed that the Ministry of Agriculture had identified and informed the MoENRP about the existence of certain amount of Methyl Bromide stored in an unsafe way. Thus, the idea of conducting a detailed survey for this substance would be a step towards the safe disposal and handling of other unwanted ODSs at national level.

UNDP-Ghana EPA
Pilot demonstration project on ODS waste management and disposal

Final report to the Multilateral Fund Secretariat

Prepared by Mr. Kweku Ofori-Bruku
Reviewed by Ghana EPA and UNDP

Updated report – May 2017

Summary of the project details as per the approval:

COUNTRY:	**Ghana**	**IMPLEMENTING AGENCY: UNDP**
PROJECT TITLE:	**Pilot Demonstration Project on ODS-Waste Management and Disposal**	

SECTOR:	**ODS-Waste**
Sub-Sector:	**Refrigeration Servicing Sector**
Date of Approval	April 2011
PROJECT IMPACT:	**8.8 Metric Tons of CFC-12**
PROJECT DURATION:	**36 months**
LOCAL OWNERSHIP:	**100 %**
EXPORT COMPONENT:	**0 %**
REQUESTED MLF GRANT:	**US$ 198,000**
IMPLEMENTING AGENCY SUPPORT COST:	**US$ 17,820 (9%)**
TOTAL COST OF PROJECT TO MLF:	**US$ 215,820**
COST-EFFECTIVENESS:	**US$ 22.5/kg ODS (metric)**
NATIONAL COORDINATING AGENCY:	**Ghana-EPA**

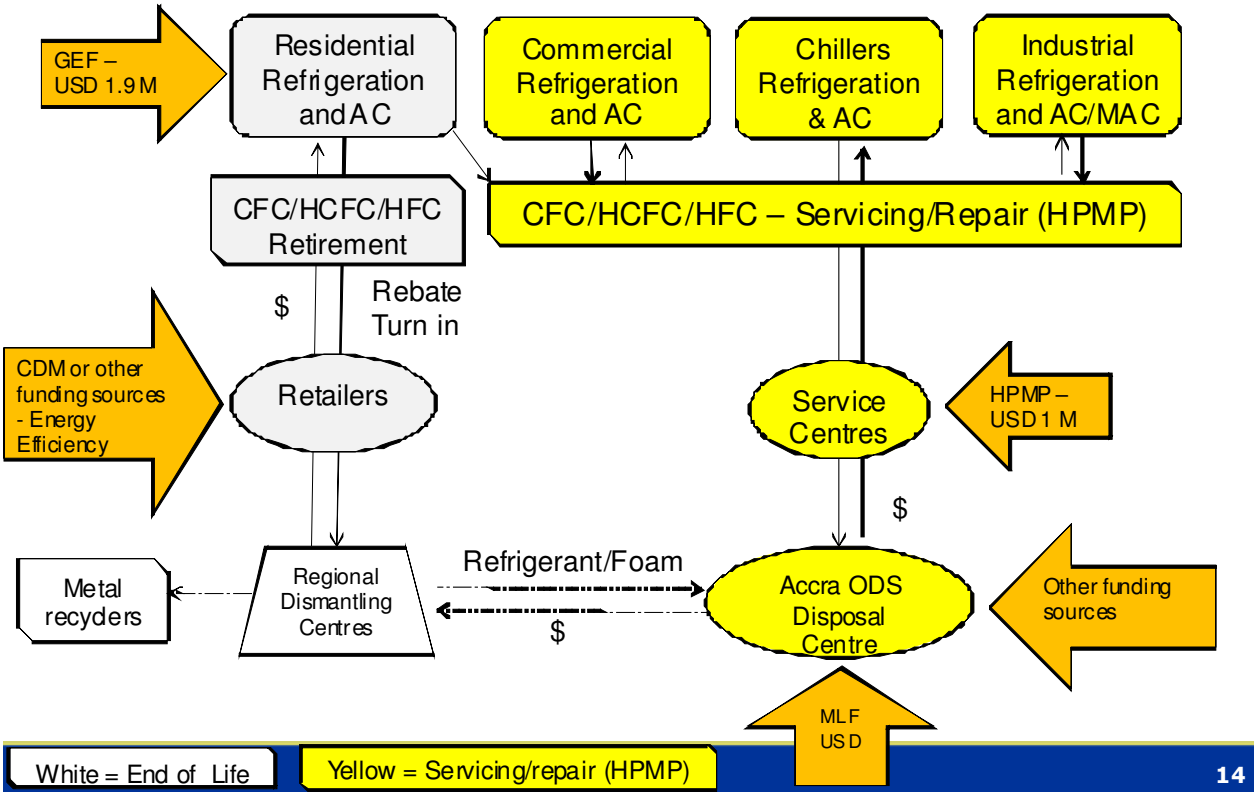
Brief Description of the Project

UNDP Ghana in collaboration with the Environment Protection Agency (EPA), Energy Commission of Ghana and the Center for Rural and Industrial Research (CRIR) had developed an overarching strategy to provide climate and ozone benefits through the Integrated Plan for Energy Efficiency, Climate Mitigation and ODS Reductions for the Refrigeration Sector as shown in Figure 1. This integrated plan brings about the convergence of 3 synergistic interventions to combine and sequence financing for: (i) the phasing out of HCFC based appliances (MLF); (ii) the promotion of energy efficient refrigerators through Market Transformation (GEF) and (iii) the complimentary pilot project for the recovery and disposal of ODS (MLF). The ultimate objective of this plan is to bring economic, social and environmental benefits to the people in Ghana through the scaling up of energy efficient appliances with low global warming potential (GWP) and zero ozone depleting potential (ODP) for the mainstreaming of ozone and climate benefits into the national development plan.

This 'learning by doing' pilot sought to demonstrate how the technical, financial, regulatory and institutional barriers and risks could be overcome to set up an ODS management-disposal facility. The project aimed to demonstrate the management and disposal of ODS refrigerants recovered from old stocks (1.8 t) and subsequent early retired or end of life (EOL) refrigerators/freezers, air-conditioners as well as from the servicing sectors. Waste-ODS would be transported from the refrigerator dismantling centers to be set up with the assistance of the GEF-project (for end-of-life equipment) as well as from the Recovery Centers to be set up through the MLF-funded HPMP (for functioning equipment being serviced). The ODS thus collected would be transported and destroyed overseas. Opportunities to monetize the ODS destroyed as carbon credit for the voluntary market will be explored so that alternative sources of funds may be tapped into once this MLF-

funded demonstration project will be completed. In addition to the carbon market, other financial modalities will also be explored: bilateral grants and auction from the European Union Allowance (EUA). This should ensure sustainability of the operation beyond the duration of this demonstration.

Figure 1: Integrated Plan for Energy Efficiency, Climate Mitigation and ODS Disposal Management



1. Introduction and Background

This pilot project sought to develop an efficient and cost effective logistic framework for the harvesting, canning, transportation, decanting, storage of ODSs collected from refrigerators, freezers and air conditioners in Ghana, prior to shipment to Europe for safe destruction.

This pilot project was a crucial part of the overarching strategy that was formulated as an Integrated Plan for Energy Efficiency, Climate Mitigation and ODS Reduction for the Refrigeration Sector in Ghana.

Therefore, this pilot project was closely integrated with the recently completed GEF-funded UNDP Energy Efficiency (EE) project ("Promoting Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana")[1] through which End-of-Life (EOL) and early retired energy inefficient refrigerators and freezers were collected and dismantled in regional depots for ODS recovery. The GFE-funded UNDP project was being implemented by the Energy Commission of Ghana, assisted by the Environmental Protection Agency, Ghana.

The primary objective of that project was to improve the energy efficiency of appliances marketed and used in Ghana through the introduction of a combination of regulatory tools such as Minimum Energy Performance Standards and Information Labels (S&L), and innovative regulatory tools including a total ban on the importation of used refrigerators and freezers into Ghana, effective 30th June 2013, and the outright seizure and dismantling of such equipment not complying with the law.

Incentive schemes in the form of rebates were given for turned-in refrigerators at Ghana Cedis (GHC) 200.00, in exchange for the purchase of a one or two star-rated refrigerator or freezer (as per the energy-efficiency star-rating), and GHC 300.00 for the purchase of any sized refrigerator or freezer of three-star rating and above.

2. Setting-up of the operations of the project

2.1 Contractors for collection of refrigerators

Revenue was generated for the private operators of the dismantling facilities, which have a convention with the Ghana EPA, and receive no fee for their services. They collect revenues from the dismantled equipment (selling of scrap metal). In that sense, the value of the dismantled equipment is put back in the system.

2.1.1. First contractor: City Wastes and Management Company (CWMC) and setting-up the National ODS centre

The Refrigerator Incentive/Rebate scheme was officially launched in September 2012.

A contract was signed by Ghana EPA with the City Wastes and Management Company (CWMC) to collect the rebated refrigerators for destruction in their facility in Kwabenya, Accra. The CWMC imported a mobile ODS degassing plant from Germany that would be able to recover refrigerants from any refrigerator or freezer from any part of the country.

[1] https://www.thegef.org/project/spwa-cc-promoting-appliance-energy-efficiency-and-transformation-refrigerating-appliances

This equipment, which was assumed to be the first of its kind in Africa, was commissioned in November 2012.

In January 2013, the National Ozone Unit (NOU) of the Ghana EPA assisted by UNDP, acquired a 40-footer container; rebuilt and reshaped it for use as both an office, laboratory and storage facility as a National ODS Collection Centre. This National ODS Centre was situated within the CWMC yard in Kwabenya, Accra.

By April 2013 the laboratory equipment, tools and computer, printer and communication equipment were acquired for the National ODS Collection Centre and the facility became functional. Additionally, 50 units of 12kg empty refrigerant recovery cylinders were procured for the project.

Between May 2013 and January 2014, the total refrigerators dismantled by the CWMC staff with some ODS in them was 7,056.

By January 2014, the EPA had established the full-functioning National ODS collection center which included a storage facility for the receipt of the ODS, as shown above.

Unfortunately, in February 2014, the project team was informed by the management of CWMC that their premises in which the National ODS Collection Center was situated, were temporarily not accessible due to a rent dispute that the CWMC had with their landlord. The Centre could not be used or visited until November 2014.

During that period, equipment such as refrigerant analyzers, recovery machines, scales and refrigerant transfer tools, as well as office equipment, were stolen. This was reported to Ghana EPA and UNDP Ghana while a police investigation was launched. Only some cylinders were left behind. This made the operation of the centre impossible after February 2014. However, activities continued under the project as described below.

2.1.2 Second Contractor: the Presank Company

To accelerate the dismantling of seized refrigerators from importers that did not abide with the new Law banning imports of second-hand refrigerators, a second company, PRESANK Ltd., was contracted in March 2014 to assist the CWMC in the degassing and the dismantling of the seized refrigerating equipment. The National ODS waste

Consultant visited the site of the Presank Company at Afienya on a weekly basis to train the technical staff of Presank, Ltd for this purpose.

The national consultant also ascertained that the Presank staff safely recovered and handled the ODS harvested from the dismantled refrigerating equipment cautiously.

The Presank Company mainly degassed and dismantled the seized refrigerators and freezers, while the CWMC was collecting, and storing the rebate refrigerators in their new yard in Afiamang for future degassing.

Staff at the Presank facility

As second-hand refrigerators are still being caught by customs, a 3rd degassing and dismantling Company to augment the degassing and dismantling might still need to be engaged in the future.

2.2. Training of Salesmen, Shop Assistants and Technical Staff

As of 2013, it became clear that both the refrigerator salespersons, shop assistants and the recipients at the CWMC needed to be trained to know how to effectively test working refrigerators. The national project consultant had to prepare training manuals and train the personnel involved both in the classroom and later follow up into the field to ascertain their competency.

The consultant also had to train the CWMC and later Presank technical staff to know how to safely handle the refrigerators prior to harvesting the ODSs, and in handling the ODSs after retrieving them.

Additionally, between April and June 2014, the National ODS waste Consultant trained shop assistants and technicians of appliance retail shops in the PZ Company, who were selected to participate in the turned-in refrigerator rebate scheme, on the testing of refrigerators prior to acceptance. Indeed, refrigerators had to be proved to be still functioning for eligibility to the rebate scheme. This was aimed to enable the proper disposal of all the ODS contained in this old refrigerating equipment.

In July 2014, a new company, Hisense Appliance Co., with several retail-shops in Accra-Tema, was appointed to participate in the turned-in refrigerator rebate scheme. The National ODS waste consultant had to train the salesmen and technicians of this new company on how to receive, inspect and test refrigerators under the rebate scheme

Between August and September 2014, the National ODS waste Consultant led a team of Technicians as part of an inventory work, to visit facilities, hospitals, hotels, mines and motels in major towns, in all the regional and most of the district capitals in the country. This was to investigate the extent of HCFCs, HFCs, HCs and other refrigerants usage in the country. This enabled the ODS Consultant to visit appliance retail shops in the Volta, Northern, Upper East, Upper West, Brong Ahafo, Ashanti, Western, Central and Eastern regions of Ghana, to find out how the shopkeepers and local technicians, who were trained in Accra, applied these skills to receive and test the refrigerators under the rebate scheme, prior to delivery to Accra. The results were generally positive as most shop assistants seen were applying the knowledge and skills appropriately.

In total, the following training was delivered through the project:

Over 300 sales personnel (a majority of women) were trained on:
- how the refrigerator works.
- how to explain the operation and safe use of the refrigerator and the freezer to their customers.
- safe ways to handle and deliver these appliances to their customers.
- courteous ways to receive and test the rebate refrigerators and deliver them for degassing and destruction.

The CWCM staff was trained on the safest ways to test and handle the rebate refrigerators prior to and after the removal of the refrigerant.

The Presank staff was trained on:
- how to use locally-devised tools to harvest good quality ODS,
- work under adverse and stressful conditions.

The ODS Decanting Staff (see section 3) was trained on:
- how to safely deal with both high-pressure and low-temperature ODS,
- how to avoid freeze burns, explosions and other gaseous accidents.

3. ODS waste export operations

3.1 Cooperation with the "Capacity Building for PCB Elimination" in Ghana

From 2014 onwards, a cooperation was developed with another GEF-funded UNDP Project, "Capacity Building for PCB Elimination" in Ghana. The project aimed to dispose of hazardous chemicals - PCBs and obsolete pesticides - through exporting these abroad in an authorised facility, for destruction as per BAT/BEP. There was an obvious opportunity to add ODS waste to this operation to achieve economies of scale, and thus with a reduced price for the disposal operation. As Ghana EPA was also in charge of the implementation of that project, the coordination was ensured within the agency, with technical support from UNDP.

Veolia UK was selected after an international competitive bidding process and in June 2015, the ODS waste project team had the opportunity to export some of the ODSs collected to date to Europe for destruction. The destruction facility was located in Poland.

It has to be noted, as was reported through the UNDP progress reports and the 2015 MLF evaluation of ODS waste projects, that the quantities of refrigerants collected have been less than anticipated in the project document. The project has however demonstrated some adaptability in that regard. Thus, considering that the CFC quantities would be less than anticipated, four cylinders of Methyl bromide that were temporarily stored at a Government pesticides storage facility and could present a risk of leaking, were identified by Ghana EPA in cooperation with the GEF-funded UNDP PCB project. It was agreed to add these chemicals to the exports of obsolete chemicals that was to be undertaken.

3.2 First and main operation of disposal of ODS

Because the National ODS collection centre had been shut down (see section 2.1.1), the project team had to improvise a temporary ODS Decanting and Export Centre within the National Refrigeration & Air Conditioning Centre of Excellence in the Accra Technical Training Centre (funded by the Ghana HPMP). There, all the cylinders containing ODSs from Ghana EPA, Accra (refrigerants collected during the TPMP), as well as the ODSs collected by Presank in Afienya and some from the ODS collection centre in Kwabenya were taken for decanting and preparation for export. The ODSs were decanted, checked and weighted at the Centre of Excellence, to prepare for the shipment.

Below is a picture of ODSs delivered to the Shipper's Warehouse in Pokuase, on July 11, 2015

In addition to CFC-12, some adulterated refrigerants were also included in the exports for destruction.

Total number of refrigerants (with a vast majority of CFC12) shipped out for destruction via the Veolia UK Company to Europe was 1,272.66 Kilograms. 406.37 Kg were collected through the rebate scheme and 866.29 kg were collected from the stored refrigerants from the TPMP.

In Annex are copies of the Certificates of Incineration of the ODSs and other chemicals submitted by the Sarpi Veolia Company. As indicated in the certificate, when weighted at arrival for destruction, the certified total quantity of refrigerants destroyed was 1,200 Kg. In addition, 5,200 kg of Methyl Bromide were also destroyed through the same operation.

3.3 Second and complementary operation of ODS disposal (2017)

Some quantities of R12 refrigerants had remained under custody of the CWMC company since 2015 and the company had committed for their disposal through voluntary carbon market.

This was confirmed and completed in 2017.

Ghana EPA received in January 2017 a letter of intent of export seeking from Ghana EPA an authorization for export of R12 intended for destruction. The letter was received from Tradewater LLC company in the USA, which worked in in cooperation with CWMC. The

quantities of R12 set for export in an authorised facility in the US amounted to 1 tonne. Besides the 469 kg recovered R12 obtained and detained through the dismantling process, which CWMC kept for the voluntary market option, additional 531 kg were procured from stocks of a dealer (remaining unused R12) to make up for the 1 tonne for shipment. Ghana EPA confirmed that the export occurred in April 2017. Voluntary Carbon markets were used to fiancé this operation, at no cost for the project. It is anticipated that Tradewater will come for the residual stocks from the dealer should they be granted an import permit by the US EPA in future.

3.4 The issue of foam collected from the refrigerators

Much as the two companies colleting refrigerators were quickly getting rid of the steel and non-ferrous parts of the dismantled refrigerators, the disposal of the huge mass of Polyurethane insulation and plastic materials from the dismantled refrigerators was creating a storage problem on their sites.

The foam extracted form the collected refrigerators could not be included in the two shipments sent for destruction, in Europe and in the US.

Thus, the volume of foam collected became substantial and created a challenge for the dismantling operation. A solution needed to be found for their disposal in an environmentally-sound manner, in accordance with Montreal Protocol's requirements. In the meantime, the project team advised the companies to pack the insulation materials from the dismantled refrigerators into sealed plastic bags and stock pile them while an environmentally acceptable procedure for destroying the insulation materials was being sought.

Collaboration was developed between the project, Ghana EPA and GIZ/Proklima, through GIZ's project "Management and destruction of Ozone Depleting Substances banks (ODS banks)". This was meant ensure the sustainability of the results of the MLF-funded ODS disposal project, and to find a joint solution for the remaining quantities of foams collected from the refrigerators.

Currently, under the GIZ project, the procurement of a cross flow chopper with an integrated foam blowing agent absorption system that uses an active carbon storage is in process. An expression of interest to operate the facility has already been published and three companies have been shortlisted (this is as well in process).

Additionally, though the rebate scheme has now ended, there is a substantial number of refrigerators and freezers to be dismantled and degassed and thus a remaining amount of refrigerants to be collected for destruction.

3.5 Total ODS disposed and destroyed

Total quantities that have been collected / destroyed are the following:

Refrigerants destroyed (in high majority R12):

- 1.2 MT through the disposal at Sarpi Veolia's incineration plant (Poland)
- 1 MT of R12 through the CWMC/Tradewater disposal in the USA
- Foam collected from the refrigerators (not yet destroyed) – quantities cannot be assessed in comparable figures. They are to be destroyed through the GIZ Proklima project.

Methyl bromide destroyed:

- 5.2 MT through the disposal at Sarpi Veolia (Poland). With an ODP of 0.7 for Methyl Bromide, this represents 3.64 ODP tonnes.

Total quantities disposed of (not including foam): **7.4 MT.**
Assuming an ODP of 1 for the refrigerants destroyed, the total ODP disposed of amount to 3.64 + 1.2 + 1 = **5.84 ODP Tonnes.**

Considering that some of the adulterated refrigerants that were exported had an ODP below 1, it can be assumed that ca. **5.5 ODP tonnes** have been destroyed (not including the quantities of foam still to be destroyed).

4. Lessons learnt

4.1 Technical challenges and solutions

- The compressors on most of the refrigerators seized by customs (over 70%) had been chopped off, hence there were no refrigerants in them. This is one of the reasons for the lower amounts of CFCs collected as compared to initial estimates.

- The few refrigerators and freezers with compressors on them had their refrigerants leaked out hence the entrance of non-condensable gasses into the ODSs that were collected. Indeed, the project team noticed from the analysis of the refrigerants/ODSs recovered that the ODSs contained some amounts of non-condensable gasses in them.

This is important to note as, during decanting prior to export, pressures of the ODSs went up very high within a short time. This sudden rise in operating pressure could be very hazardous if not carefully watched due to the presence of non-condensable gases.

- Standard refrigerant cylinder heaters are required to accelerate the transfer of ODSs from cylinders to cylinders during the collection and decanting of the ODSs for export. Portable water heaters were improvised to accelerate the decanting procedure.

- A portable refrigerant re-claiming machine is required to restore the refrigerants/ODSs collected to an acceptable standard for possible reuse and the expected carbon credits from destruction.

- The project team needed portable hand-held refrigerant identifiers to ascertain the refrigerant/ODSs in every refrigerator before recovery and to prevent cross contamination.

4.2 General lessons learnt

- Synergy with other projects can bring solutions to challenges unforeseen at the project conceptualization phase
- Carbon markets instability are a challenge for this type of projects. Though an operation could be eventually launched in 2017, this did not have the scope that was initially envisaged at the start of the project.
- There is a confirmed interest of the private sector to get involved in such operations (and to continue exploring the carbon financing options), as was demonstrated in 2017 by the export to the USA of some remaining quantities of ODSs
- It is a complex but useful approach to combine with other waste streams' disposal processes (in that case, PCBs and pesticides)
- It was a good strategic approach to also combine with a rebate scheme. Another stream of old refrigerators comes from the seized refrigerators by customs, due to the ban on 2d-hand refrigerators entering the country.
- Addressing the stocks of collected foam represents a major technical challenge in this type of projects.
- It has been difficult in this project to determine the cost per tonne destroyed, due to the nature of the export for destruction operations. Ghana EPA charged a pro-rata agreed amount internally to the project budget for the disposal of refrigerants and Methyl Bromide. There has been no cost to the project for the export to the USA in 2017 or for the future destruction of collected polyurethane foam.
- As regards export transportation, this took time and considerable joint efforts to get the consent of the importing authority, due to the complex nature of the waste (mix of PCBs, pesticides, ODSs) being exported for destruction.

ANNEX 1 – Certificate of incineration – SARPI VEOLIA – Including Ozone-Depleting Substances

SARPI VEOLIA

Date: 27 October 2015

Certificate of Incineration

Veolia Job No: FSJT0667

We hereby certify that the waste described below has been delivered to/destroyed by high temperature incineration at Sarpi Dabrowa Gornicza:

Container Number :	As per attached annex
TFS Number :	As per attached annex
Material :	As per attached annex
Delivery Date(s) :	As per attached annex
Delivery By:	Geodis Calberson

CERTIFIED BY : Judith Hunt
TITLE : Customer Services Manager
for and on behalf of: **Veolia ES Field Services Limited**
Unit 1, Heol Crochendy
Parc Nantgarw
Cardiff. CF15 7QT

SARPI VEOLIA

Veolia ES Field Services Limited
Unit 1, Heol Crochendy,
Parc Nantgarw
Cardiff
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A SARP Industries Limited Company
Registered office: Unit 1 Heol Crochendy, Parc Nantgarw, Cardiff, CF157QT
Registered in England 7816723

SARPI VEOLIA

EMPLOYER/EXPORTER ENVIRONMENTAL PROTECTION AGENCY OF THE REPUBLIC OF GHANA

SERVICE PROVIDER VEOLIA ES FIELD SERVICES LIMITED

CONTRACT NAME PROVISION OF SERVICES FOR THE FINAL DISPOSAL OF PURE POLYCHRORINATED BIPHENYLS (PCBs), PCB CONTAMINATED WASTES, OBSOLETE PESTICIDES AND OZONE DEPLETING SUBSTANCES FROM GHANA

Container Number	Waste Type	TFS Shipment Number	Arrival Date	Waste Received Weight (Kg)	Completion Date
MEDU 2882261	Pesticide Solid	GH603391 / 01	11-Sep-15	750	19-Oct-15
MSCU 5032780	Pesticide Solid	GH603391 / 02	09-Sep-15	12,886	19-Oct-15
MSCU 5896350	Pesticide Solid	GH603391 / 03	09-Sep-15	4,661	19-Oct-15
MEDU 4128245	Pesticide Solid	GH603391 / 04	09-Sep-15	7,235	19-Oct-15
MEDU 3994121	Pesticide Solid	GH603391 / 05	11-Sep-15	2,980	19-Oct-15
MEDU 2166694	Pesticide Liquid	GH603392 / 01	11-Sep-15	13,280	19-Oct-15
MEDU 2882261	Pesticide Liquid	GH603392 / 02	11-Sep-15	10,850	19-Oct-15
MSCU 5896350	Pesticide Liquid	GH603392 / 03	09-Sep-15	10,961	19-Oct-15
MEDU 3994121	Pesticide Liquid	GH603392 / 04	11-Sep-15	4,050	19-Oct-15
FSCU 7423560	Pesticide Liquid	GH603392 / 05	14-Sep-15	15,900	19-Oct-15
GLDU 3808441	Pesticide Liquid	GH603392 / 06	14-Sep-15	13,800	19-Oct-15
MEDU 2832595	PCB Liquid	GH603393 / 01	20-Aug-15	15,800	08-Sep-15
MEDU 3440032	PCB Liquid	GH603393 / 02	18-Aug-15	15,400	08-Sep-15
GLDU 3808441	PCB Liquid	GH603393 / 03	14-Sep-15	800	19-Oct-15
MSCU 0243769	PCB Solid	GH603394 / 01	18-Aug-15	3,640	08-Sep-15
MSCU 4660570	PCB Solid	GH603394 / 02	18-Aug-15	14,900	08-Sep-15
MEDU 4128245	MeBr	GH603395 / 01	09-Oct-15	5,200	19-Oct-15
MEDU 4128245	ODS	GH603396 / 01	09-Oct-15	1,200	19-Oct-15
			TOTAL TONNAGE	154,293	

SIGNED
JUDITH A. HUNT (Mrs)
CUSTOMER SERVICES MANAGER

ANNEX 2 – Letter requesting license to export R-12 for destruction – Tradewater / City Waste.

tradewater

12 January 2017

Sent via Email

Environmental Protection Agency
Mr. Emmanuel Quansah
Head Environmental Climate Change Ozone Unit
P.O Box MB326
Accra - Ghana
e-mail: emmanuel.quansah@epa.gov.gh

Dear Mr. Quansah:

As you know, Tradewater, LLC, is working closely with you and Mr. Jürgen Meinel of City Waste Recycling, Ltd., to transport to the United States certain chlorofluorocarbon refrigerants. The refrigerants to be transported include approximately 469 kilograms of recovered R-12 and approximately 531 kilograms of unused R-12. We are transporting the refrigerants from Ghana to the United States for destruction in a permitted facility.

Tradewater has applied to the United States Environmental Protection Agency (US EPA) for permission to import the material to the United States. Upon approval by the US EPA, Tradewater (in conjunction with Mr. Meinel) will then need to seek from you and the Ghana EPA an export license granting permission for the refrigerants to be exported from Ghana.

This letter confirms our intent to seek the Ghanaian export license and your authority to issue that export license when Tradewater and Mr. Meinel submit the necessary information for application.

Please let me know if you have any questions or concerns.

Sincerely,

Timothy H. Brown
President

Cc: Robert Burchard, U.S. Environmental Protection Agency (odspetitions@epa.gov)
Jürgen Meinel, City Waste Recycling (recycling.ghana@gmail.com)
Gabriel Bankier Plotkin, Tradewater (gplotkin@tradewater.us)

FINAL PROGRESS REPORT ON
NEPAL ODS DISPOSAL PROJECT SUBMITTED TO
THE 79TH EXECUTIVE COMMITTEE

BACKGROUND

The project for Nepal was approved by the Executive Committee at the 59th meeting to allow Nepal to explore two options for destroying a small amount of unwanted ODS that had been collected and stored through the national ozone unit.

In the year 2004, 74 ODP tonnes of CFCs were confiscated in Nepal. Most of these stocks were consumed for domestic purposes following MOP decision XVI/27 (Annex. 1) made at the Sixteenth Meeting of the Parties. As of 1.1.2010, out of this initial stock of 74 tonnes approximately 10 MT (metric tonnes) of CFCs were in stocks at Birgunj, Nepal. In the 20th Meeting of Parties, Nepal requested guidance from Parties on continued use of these CFCs post 2010. In this context, Nepal proposed to consider options for destruction of this quantity of CFCs. If destroyed, it would also achieve twin benefits of compliance with the Montreal Protocol and Green House Gas (GHG) emission reduction; otherwise the ODS would slowly be released into the atmosphere from the cylinders in which they were stored or potentially be used in the future if consumption limits were revised.

Such a scenario in Nepal is a good example of a Low Volume Consumption Country (LVC) in the Asia and the Pacific region, where there is no clear guidance from the Montreal Protocol on how to treat such unwanted CFC stocks (collected or seized). UN Environment submitted a request for a pilot ODS disposal project for Nepal in line with decision 58/19 that laid out the guidelines for developing a limited number of demonstration projects for disposal. This pilot project was proposed to design an approach for the final disposal/destruction of the remaining amount of approximately 10 MT of CFCs as of 1.1.2010.

Based on the guidance of the Meeting of Parties to the Montreal Protocol on encouraging ODS destruction in Article 5 Parties, the Multilateral Fund (MLF) approved a pilot project on destruction of Nepal ODS stock at its 59th meeting. UN Environment spearheaded the Nepal ODS Destruction Project as an important step to explore various options for destruction of small stocks in LVCs. The project has been completed and it has provided a model for replication for other LVCs.

The pilot project sought to generate data and experience on options for disposal of the current volume of ODS available for destruction as of 1.1.2010. UN Environment was advised to consider two options: (1) the use of a mobile destruction facility that could be rented and shipped back to the country of origin once the ODS is safely destroyed, or (2) transporting the waste ODS to a recycling facility outside the country. The cost of the project as approved was US $157,200 plus support costs and covered interim storage of cylinders, costs for the transport of

the materials to the facility, as well as the operationalization of the destruction process including monitoring and reporting the final quantities destroyed. The pilot aspect would be demonstrating the use of this equipment, the results of which would be useful to LVC countries and provide cost effective options for countries that have small volumes of unwanted ODS that require destruction.

During the review of the project during the 59th Excom., one Member expressed the hope that, in the development of the project, the implementing agency and the country would ensure that it was truly a demonstration project, i.e. that it would demonstrate how the activity would be sustained and how, under relevant circumstances, it could access sustainable funding for climate activities. The project should also be designed to show how portable destruction technology could meet the needs of the country, as well as its value for similar LVC countries when dealing with unwanted ODS. Another Member said that UN Environment should make sure that the first phase of the project included a comprehensive cost-effectiveness analysis of the two options: (i) use of a portable destruction facility; and (ii) transporting the waste ODS to a recycling facility. In the second phase of the project, the most cost-effective of the two options should be used and implementation should be done in partnership with another agency.

PAST PROGRESS REPORTING

UN Environment submitted, on request of the MLF Secretariat a progress report to the 70th Meeting of the Executive Committee that met on 1-5 July 2013 which detailed the process of destruction of 9.03 MT of CFC 12 in a facility in USA and provided details on the use of the draft guidelines for ODS disposal projects. At that same meeting, UN Environment had provided a report on the overall implementation process of this project. This report can be seen in Document UN Environment/OzL.Pro/ExCom/70/54, dated 5 June 2013. UN Environment provided an update on the progress of the implementation of the Nepal project, where specific timelines and target outputs achieved were listed. The selected approach that the destruction project used was to export the ODS for destruction to the United States of America. This was done through a partner, EOS Climate, who organised the transfer to a licensed facility for destruction. UN Environment reported that the shipment reached the United States of America in November 2012, and subsequently has been reported as destroyed as of February 2013. The amount of ODS handled in this project was approximately 10 ODP tonnes (107,000 CO2-equivalent tonnes). For the preparations of the 72nd ExCom in April 2014 and 76th Excom in May 2016, extensive information specifically in regard to carbon credits and their sale was provided to the Secretariat.

UNEP further reported that in March 2013, the Nepal project was submitted to the Climate Action Reserve (CAR). This has subsequently been listed in CAR with a reserve project identification number of CAR955. Upon further verification with the CAR website, the Secretariat noted the project has now changed status with CAR as registered, as of 24 May 2013.

It has met final verification requirements of the CAR, and Climate Reserve Tonne (CRTs) have now been issued[1].

UN Environment's partner *EOS Climate* had obtained the first carbon credits in 2013 by destroying 9.03 MT of CFC 12. Since the 72nd Meeting, most of the work has been related to registration of the credits in the voluntary carbon market obtained by destroying the CFCs and efforts to sell them. The voluntary carbon markets have experienced an all-time decline in potential worth of the credits and prospective buyers of the same. As a result, the credits have still not been completely sold.

Under the Nepal project 82,391 Verified Emission Reductions (VERs)[2] have been generated. All of these are being offered for sale. The state of the carbon voluntary market is such that it is likely that more than one buyer will be involved, rather than a single buyer who wants all of the VERs at once. Under this project Climate Reserve Tons (CRTs)[3] were generated because the Climate Action Reserve Article 5 ODS Protocol was used. CRTs are one type of VERs. *EOS Climate* has been seeking buyers and in June 2014 established a marketing agreement with *The Carbon Neutral Company*, a leading retailer of voluntary carbon credits.

EOS Climate is currently vetting prospective purchasers for the offset credits that resulted from the project. Partners in this project remain optimistic they will find a buyer(s) willing to make a commitment to this new type of credit. The current price for voluntary credits is in the order of

[1] Project developers submit a project by uploading the necessary forms and supporting documents to the Climate Action Reserve online software. The Reserve staff pre-screen projects for eligibility. Eligible projects are posted on the Reserve site with a status of "listed." The next step is verification by an independent, accredited verification body. Once completed, Reserve staff review the verification documentation, and if the project passes this final review process, it is labeled "registered" and CRTs are issued. Project developers submit a project by uploading the necessary forms and supporting documents to the Reserve online software. The Reserve staff pre-screen projects for eligibility. Eligible projects are posted on the Reserve site with a status of "listed." The next step is verification by an independent, accredited verification body. Once completed, Reserve staff review the verification documentation, and if the project passes this final review process, it is labeled "registered" and CRTs are issued.

[2] VERs is a generic term for offsets. There are three main market drivers for demand in the voluntary market. Firstly, as a key component of a company's marketing strategy linked to corporate social responsibility. Secondly, as a profit-making enterprise where financial participants build portfolios of VERs in order to obtain returns on capital employed. And thirdly, as a valuable learning exercise for forward looking companies and investors who anticipate future participation in the compliance regime. Verified Emission Reductions are derived from project-based emissions reductions from a wide range of technologies and project types.

[3] CRTs are offsets unique to the Climate Action Reserve. VERS is a generic term for offsets and CRTs are offsets unique to the Climate Action Reserve. Under this project CRTs were generated because the Climate Action Reserve Article 5 ODS Protocol was used. CRTs are one type of VERS.

approximately range of US $0.55 per tonne and partners are seeking a higher price given the high quality of the project and the credits.

In December 2014, *EOS* closed a transaction to sell 22,000 of the carbon credits generated from the Nepal project. They will continue to work to find a buyer(s) for the remaining 60,391 credits. As an innovative approach under this project, it has been agreed that a portion of the revenue from the sale would be committed to the Government of Nepal to support local sustainability initiatives. The Agreement between the UN Environment partner and UNOPS specified that the revenue returned to Nepal would be paid into a fund established by the Government of Nepal in consultation with UN Environment, dedicated to training, job creation, capacity building, and community development focused on refrigerant management, energy efficiency, and environmental sustainability. This is not a typical structure for offset projects but partners believed it would enhance the project's appeal and establish a good model for future ODS projects and hence the UNOPS contract with *EOS Climate* included a provision whereby a portion of the revenue be shared with Nepal even though sale of credits was not an objective or an output of the approved project. This approach also highlighted that sale of credits, if possible, could make the project sustainable to some extent. The share of credit sales revenue that will be transferred to Nepal is specified in the December 2011 Agreement with UNOPS:

- 10% of the Gross Revenue up to US $1.50 per credit; and
- 25% of the Gross Revenue thereafter.

Following this the Nepal share of US $12,925 from the sale of 22,000 credits were remitted to NBSM bank account on February 15, 2017. Some of the key areas which are being explored for utilisation of these funds in consultation with the Government are:

1. Strengthen the agreed activity with private partnership. Explore possibilities of involving OEMs that are introducing air conditioners based on HCFC and HFC alternatives in the Nepal market;
2. Focus on flammable refrigerants and country needs to address flammable refrigerants
3. Build capacity of local technicians (master trainers) on handling flammable refrigerants through a training programme conducted with private partners as part of south-south cooperation.
4. Build capacity of local technicians (master trainers) on handling flammable refrigerants through a training programme conducted in Nepal in collaboration with NREMA and OEMs
5. Mainstream the module on handling flammable refrigerants in the curriculum of training institute in Nepal through the HPMP funds
6. Develop a certification scheme for certifying technicians to handle flammable refrigerants.

The state of the carbon markets has drastically changed since 2010 when the project was initially conceived, adding a challenge to sale of the credits. The partners remain intent on following

through on the final step to work with numerous parties involved in the global carbon markets in efforts to find a buyer for the remaining 60,391 credits and demonstrate to the Parties that carbon finance is a viable mechanism to address remaining ODS banks. There is no way to predict the timing.

In summarizing the demonstration value of the Nepal project, the work on this project provided an opportunity to link ODS destruction to the carbon market and explore the possibility of other financial mechanisms to support ODS destruction activities. The project's registration with the CAR is a good example for other countries who are pursuing this track for their ODS disposal projects. UN Environment also reported that one of the challenges that was faced during project implementation was the lengthy process to get approval for the export of the ODS to the United States of America, because of the legal impediments that required Parliamentary clearance. However, this was also an important lesson learned for the project as it allows UN Environment to use the same approach for similar issues in the future.

The project was a pilot project with demonstration capabilities. This project handled the destruction of the ODS according to strict standards and should serve as a model for international ODS offset projects and corporations that want to invest in international ODS projects. There are implications of this project for Article 5 countries on leveraging carbon-finance with their collected or potential ODS waste. The project demonstrated how unwanted ODS can be disposed of safely and cost-effectively in collaboration with the private sector, leveraging state-of-the-art technologies, operational systems, and when the credits are ultimately sold, carbon finance. This single project prevented emissions equivalent to over 107,000 tonnes of carbon dioxide. It helped establish for the international community a sustainable model of securing carbon finance for management and disposal of CFC stocks in developing countries, while delivering significant environmental and economic co-benefits. Some of these lessons learnt for LVCs from this demonstration project can be seen at **Annex. 2** to this document.

Annex. 1

Decision XVI/27. Compliance with the Montreal Protocol by Nepal

1. To note that Nepal ratified the Montreal Protocol and the London Amendment on 6 July 1994. Nepal is classified as a Party operating under paragraph 1 of Article 5 of the Protocol and had its country programme approved by the Executive Committee in 1998. The Executive Committee has approved $453,636 from the Multilateral Fund to enable compliance in accordance with Article 10 of the Protocol;

2. To recall that in its decision XV/39, the Fifteenth Meeting of the Parties had congratulated Nepal on seizing 74 ODP tonnes of imports of CFCs that had been imported in 2000 without an import license, and on reporting the quantity as illegal trade under the terms of decision XIV/7;

3. To recall that, in paragraph 5 of decision XV/39, the Parties had stated that, if Nepal decided to release any of the seized quantity of CFCs on to its domestic market, it would be considered to be in non-compliance with its obligations under Article 2A of the Montreal Protocol and would therefore be required to fulfil the terms of decision XIV/23, including submitting to the Implementation Committee a plan of action with time-specific benchmarks to ensure a prompt return to compliance;

4. To clarify the meaning of paragraph 5 of decision XV/39 to mean that Nepal would only be considered to be in non-compliance if the amount of CFCs released on to the market in any one year exceeded its permitted consumption level under the Protocol for that year;

5. To note further that Nepal's baseline for CFCs is 27 ODP tonnes;

6. To note with appreciation Nepal's submission of its plan of action to manage the release of the seized CFCs, and to note further that, under the plan, Nepal specifically commits itself:

(a) To release no more than the following amount of CFCs in each year as follows:

(i) 27.0 ODP tonnes in 2004;

(ii) 13.5 ODP tonnes in 2005;

(iii) 13.5 ODP tonnes in 2006;

(iv) 4.05 ODP tonnes in 2007;

(v) 4.05 ODP tonnes in 2008;

(vi) 4.00 ODP tonnes in 2009;

(vii) Zero in 2010, save for essential uses that may be authorized by the Parties;

(b) To monitor its existing system for licensing imports of ozone-depleting substances, including quotas, introduced in 2001, which includes a commitment not to issue import licenses for CFCs, in order to remain in compliance with its plan of action;

(c) To report annually on the quantity of CFCs released pursuant to paragraph 6 (a) above;

(d) To ensure that any quantities of CFCs remaining after 2010 are not released on to its market except in compliance with Nepal's obligations under the Montreal Protocol;

7. To note that the measures listed in paragraph 6 above will enable Nepal to remain in compliance;

8. To monitor closely the progress of Nepal with regard to the implementation of its plan of action and the phase-out of CFCs;

Annex. 2

EXPERIENCE AND LEARNINGS FOR OTHER LVCs

The experience in Nepal has helped build the framework for developing a work plan for the NOUs for development of the projects for destruction of unwanted ODS in their countries. The salient features of such actions would include:-

1. Get started with inventorisation of the stock immediately
   - Locate the various stocks of ODS distributed all over the country
   - Quantify the stock
   - Collect the stock in a single location and ensure that it is kept in an environmentally protected condition
   - Proper documentation of the origin of the stock
   - Arrange for testing of the stock, and establish the purity

2. Consult with the relevant Ministry with regard to advanced funds, collection and distribution of revenues

- Determination of possibilities of linkage for other projects in the country
- If linkage is established, then explore possibilities for funding from such programs with the help of the concerned ministries

3. Identify any legal limitations for the Ministry of Environment, Ministry of Commerce and Customs Department for facilitating the project

- Policies and regulations regarding the establishment of destruction facilities in the countries
- Establishing of roles and accountability of the various ministries and departments
- Arrange for training and awareness programs for the personnel of the concerned ministries regarding harmful effects of ODS and the necessity of their destruction programs
- Establish a proper network for coordination among all these ministries and departments

4. Identify existing legal procedures pertaining to the export of collected ODS

- Any ban on the export of the ODSs should be relaxed for the purpose of ODS export for destruction
- Establish necessary administrative framework to facilitate the process
- Prepare proper documentation for providing framework to the process if the export is to be done more than once
- Any exemption given for ODS export should be monitored with close coordination with all concerned parties

5. Review existing legal procedures in relation to the following

- Disposal of hazardous wastes
- Import and export of hazardous wastes (if unwanted ODS is considered as hazardous wastes)
- Fee structures for government permits and clearance
- Prepare proper documentation for the same, specifically for ODS

6. Involve with CDM Designated National Authority (DNA) for applicability of CDM/VCM for this project

- If destruction facilities are established in the country, then determination of the CDM/VCM eligibility of the project should be determined from the DNA
- Establish proper policies and guidelines for the same
- Arrange for administrative framework for facilitating the process

7. Conduct a detailed stakeholder consultation and survey

- Identify the stakeholders – Some of them are listed below:-
  - Government of the LVC concerned
  - National Ozone Unit, Ministry of Environment

- Ministry of Energy
- Department of Customs
- Ministry of Commerce
- Climate Change Focal Points
- Private Sector
- Importers & retailers of RAC equipment
- Transporters, container companies, freight forwarders
- Pesticide suppliers and manufacturers
- Industry Associations
- Transport and freight carriers
- Hospitality sector
- Refrigeration & Air-conditioning Training Centres

- Define roles and contributions of the stakeholders for the project
- Establish accountability of the stakeholders for the same

8. Education and public awareness is vital for the success of the program
   - Develop a training manual for the technicians involved in the sectors in which ODSs are used
   - Organise awareness campaigns and workshops across the country on ODSs and their harmful effects for the general public
   - Similar campaigns should be organised for all stakeholders to raise their awareness

9. Absence of any infrastructure for recollection of ODSs
   - Equipment which are scrapped and which have reached their end of serviceable life can become sources of ODSs
   - Programs can be launched for the collection of ODSs from such equipment
   - Funding sources should be considered for the programs, which can actually be instrumental in making the projects more economically viable
   - Quality analysis and testing facilities should be established for such recollected ODSs

10. Options for ODS destruction for an LVC like Nepal
    - Bring a mobile destruction unit and destroy the ODS in situ - an expensive proposition (fixed cost of 0.2 million USD plus variable cost of 5-7 USD per kg)
    - Destroy the ODS in cement kilns within the country in the long term
    - Export the ODS to the United States or Japan for destruction

NEPAL MODEL FOR LVCs

The following figure graphically explains the replicable Nepal model for other LVCs. The process starts with Collection, Inventorisation and Testing of the ODS stocks bifurcating into Funding Review and Policy Review (With Stakeholder Consultation). After these jobs are done, the next exercise would be to export the stock and destroy it.

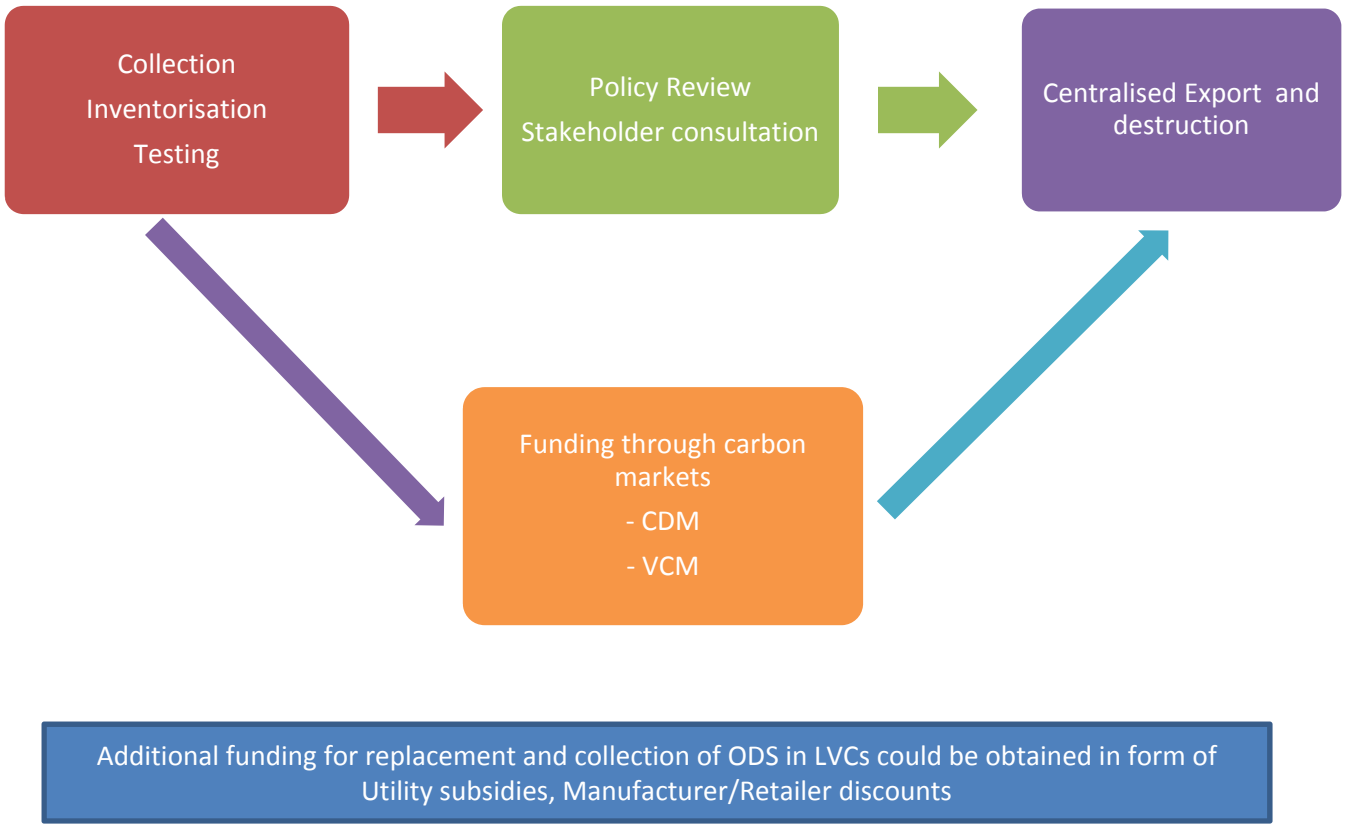

Fig 1 – Nepal Model for LVCs – ODS Destruction Project for LVCs