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控制危险废物越境转移及其处置

巴塞尔公约缔约方大会

第十三次会议

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议程项目4(a)(iii)

与执行《公约》有关的事项：

战略事项：关于防止、尽量减少和回收危险废物及其他废物的卡塔赫纳宣言

关于协助缔约方制定有效战略以实现预防和最小化危险废物和其他废物的产生及其处置的指导文件

秘书处说明

《控制危险废物越境转移及其处置巴塞尔公约》缔约方大会第十三次会议做出关于防止、尽量减少和回收危险废物及其他废物的卡塔赫纳宣言的BC-13/3号决定，以UNEP/CHW.13/INF/11文件所载的指导文件草案为基础，通过了关于协助缔约方制定有效战略以实现预防和最小化危险废物和其他废物的产生及其处置的指导文件。上述指导文件是由环境无害化管理专家工作组根据OEWG-10/3号决定、经考虑所收到的来自缔约方和其他国家的评论后编制而成。已通过的指导文件最终文本，见本说明附件。本说明及其所含附件未经正式编辑。

附件

关于协助缔约方制定有效战略以实现预防和减少危险废物和其他废物的产生及其处置的指导文件
最终修订版本（2017年5月5日）

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1. 导言

1.1. 背景

1. 本文件的目的是提供协助缔约方制定有效战略导则，以实现预防和减少危险废物和其他废物产生；也可以有助于市政和其他部门、私营企业、非政府组织（NGO）、学术界等等；所有这些都可为发展和实施废物产生预防和最小化战略的努力做出重大贡献。
2. 本文件根据关于防止、尽量减少和回收危险废物及其他废物的卡塔赫纳宣言（“卡塔赫纳宣言”）制定¹，于 2011 年由《巴塞尔公约》缔约方大会第十次会议通过（COP-10）。在卡塔赫纳宣言中，各方指出从源头上预防和减少危险废物和其他废物是废物管理体系的关键阶段，并宣布致力于加强积极促进和实施更有效的策略来预防和最小化危险废物和其他废物的产生和处置。
3. 2012-2021 年巴塞尔公约实施工作战略框架²，于 2011 年 COP-10 的第 BC-10 / 2 号决定通过，承认废物管理体系作为指导原则，并包括了“追求从源头上预防和减少危险废物和其他废物，特别是通过支持和促进国家层面的活动，这些活动旨在减少危险废物和其它废物的产生和潜在危害”的目标。
4. 此外，COP-11 的第 BC-11 / 1 号决定通过了关于危险废物和其他废物的环境无害化管理框架³强调预防和最小化危险废物和其他废物的重要性。
5. 废物产生预防和最小化也已在更广泛的范围内提出。它被列入可持续发展 2030 年议程⁴目标 12，于 2015 年 9 月联合国大会第 70 / 1 号决议通过，以确保可持续消费和生产⁵模式。该目标提出截至 2030 年，通过预防、减量、回收和再利用，废物的生产应该大幅减少。
6. 关于化学品和废物环境无害化管理的 7 号决议在联合国环境大会第二次会议通过（UNEA2）⁶，要求执行董事在全球废物管理展望 2019 年更新报告提出策略加强废物的预防、减量化、再利用、再循环和其它回收包括能量回收，实现最终处置量整体的减少⁷。此外，关于海洋塑料垃圾和塑料微粒的 11 号决议，强调废物的预防和环境无害化管理是防治海洋污染取得长期成功的关键，包括海洋塑料碎片和塑料微粒，并呼吁各成员国制定和实施与废物等级体系一致的必要政策、监管框架和措施⁸。
7. 针对上述提及的发展，通过其第 BC-12 / 2 号决定，缔约方大会的第十二次会议要求制定最新指导，旨在帮助巴塞尔公约缔约方发展有效策略来实现预防和最小化危险废物和其他废物的产生及其处置。

1.2. 范围

8. 本文件关注废物管理层次体系⁹中的上层元素，即预防、最小化和再利用。它为制定强制性和自愿的战略和措施提供指导，以实现危险废物和其他废物的预防、最小化和再利用。预防可能包括严格禁止，源头减排和直接再利用。最小化包括严格禁止，源头减排和直接再利用和

¹ 卡塔赫纳宣言见网站：

<http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/cop/cop10/CartagenaDeclaration.pdf>.

² 战略框架见网站：<http://basel.int/Implementation/StrategicFramework/Overview/tabid/3807/Default.aspx>.

³ 危险废物和其它废物的无害环境管理框架见网站：

<http://www.basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/ESMFramework/tabid/3616/Default.aspx>.

⁴ 可持续发展目标见网站：<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

⁵ 资源和能源效率提升，可持续的基础设施，提供基本服务，绿色和体面的工作以及所有人更好的生活质量。作为一个综合方法，SCP的实施有助于实现整体发展规划，减少未来的经济、环境和社会成本，增强经济竞争力和减少贫困。（<https://www.unep.org/resourceefficiency/what-scp>）

⁶ 化学品和废物的无害环境管理的7号决议见网站：<http://web.unep.org/unea/list-resolutions-adopted-unea-2>.

⁷ 见 <http://web.unep.org/ietc/what-we-do/global-waste-management-outlook-gwmo>.

⁸ 关于海洋塑料垃圾和塑料微粒的11号决议见网站：<http://web.unep.org/unea/list-resolutions-adopted-unea-2>.

⁹ 第BC-10 / 2号决议认定为预防、最小化、再利用、回收、包括能源回收的其它回收、最终处置。

回收。然而，回收，还有再生在本文件中没有提出，因为它们是其它巴塞尔公约指导文件，如技术指南的对象¹⁰。

9. 巴塞尔公约设法处理危险废物和其他废物。在公约的条文中，“其他废物”包括生活垃圾。因此，本文件还讨论了生活垃圾的预防和再利用。本文件提供的大部分指导具有一般性，可适用于生活垃圾中的危险废物和废物。

1.3. 术语¹¹

10. 本指导文件内的术语与下列文件采用的术语保持一致：巴塞尔公约第 2 条；环境无害化管理专家工作组制定的推广废物环境无害化管理实用手册，特别是术语的实用手册¹²；以及小型闭会期间法律明确工作组制定的术语表¹³。

1.4. 预防和最小化废物的目标

11. 在巴塞尔公约下，加强危险废物和其他废物环境无害化管理（ESM）的一个重要战略目标是追求在源头预防和最小化危险废物和其他废物，特别是通过支持和促进在国家范围内减少危险废物及其他废物的产生和潜在危害的活动（巴塞尔公约实施战略框架 2012–2021 目标 2.2）。

12. 废物产生预防和最小化战略或措施可能有废物生产与经济增长去耦的总目标。其他目标可能包括提高材料和资源效率，资源使用与经济增长去耦，避免原材料使用并向循环经济转型¹⁴。废物产生预防和最小化也可能将减少有害物质作为总体目标的一部分。创造工作岗位是另一个可能的目标。

1.5. 途径

1.5.1. 战略途径

13. 废物产生预防和最小化战略¹⁵不应仅是一系列自上而下的措施，而应根据对实施战略的承诺，整体考虑受影响的利益相关方的利益和关切。

14. 可以将若干潜在的废物产生预防和最小化措施，工具和计划纳入国家，次国家，地方或公司的战略。因此，废物产生预防和最小化废物的战略的主要目的是提供一个广泛的视角和框架，力求在现有计划的基础上采取最有效率和最有效的补充措施，具有约束力的同时保持自愿性。

15. 有必要采取多步骤的方法：

- a) 提供关于战略的范围与时间表的设想；
- b) 确定推动废物产生预防和最小化战略的具体目标；
- c) 确定废物产生预防和最小化战略应关注的优先领域；以及，
- d) 选择和结合将产生低环境影响和有效材料系统的措施。

16. 在上述每一步骤中，首先应确定所有潜在的有效率的方案，然后缩小到最有效的方案。

17. 选定的目标和措施应使废物产生预防和最小化战略能履行其任务，即：

- a) 激励感兴趣和受影响的利益相关方更有效地利用资源，减少污染物；
- b) 使感兴趣和受影响的利益相关方参与进来并鼓励他们；以及，
- c) 通过向感兴趣和受影响的利益相关方提供有用的示例和其他手段，使其能够采取行动。

¹⁰ 巴塞尔公约技术指南见网站：

<http://basel.int/Implementation/Publications/TechnicalGuidelines/tabid/2362/Default.aspx>.

¹¹ 本指南中的一些特定条款在脚注进行了描述。这些描述只是为了帮助读者理解列举的例子，其他例子可能存在。

¹² 文件 UNEP/CHW.13/4/Add.1/Rev.1。

¹³ 文件 UNEP/CHW.13/4/Add.2。

¹⁴ 一个产品、材料和资源的价值可以尽可能长地保留并且废物生产得以最小化的经济。定义摘自欧盟循环经济战略http://ec.europa.eu/environment/circular-economy/index_en.htm。

¹⁵ 战略可以通过强制性或自愿性的项目，计划，具体措施等来实施。

18. 废物产生预防和最小化战略分为四大类，意味着政府当局参与程度的不同，即：以信息交流，促进，管制和技术为重点的战略。

A. 信息交流战略

19. 信息化战略旨在改变行为，使决策更为明智，包括：

- a) 产品中的化学品信息；
- b) 意识运动；
- c) 关于废物产生预防和最小化技术的信息；
- d) 为利益相关方举办教育和培训项目；和，
- e) 生态标签¹⁶。

20. 知道产品中有害物质的存在对于其适当管理至关重要，包括产品的废物产生预防和最小化，回收和处置。更多地获取关于产品中化学品流动，风险和管理的知识和信息将提高替代有害物质的可能性，并使供应链内的生产者，供应者和消费者能够作出明智的选择。

B. 促进战略

21. 促进战略包括为行为改变提供激励，以及为有益的计划提供财政和后勤支持，包括：

- a) 支持自愿协议；
- b) 促进再利用，翻新和修复；
- c) 促进环境管理系统；
- d) 可持续消费和生产激励；以及，
- e) 研究与开发的促进与传播。

C. 管制战略

22. 管制战略涉及限制废物产生，扩大环境义务和对公共合同施加环境标准，包括：

- a) 规划措施；
- b) 税收和激励，例如垃圾定量收费（PAYT）计划；
- c) 生产者责任延伸（EPR）政策；
- d) 政府绿色采购¹⁷政策；以及，
- e) 生态设计¹⁸需求。

D. 技术战略

23. 技术战略涉及开发和使用旨在预防和最小化废物产生的具体技术，例如，当制造新产品或向消费者提供服务时，这些策略包括：

- a) 清洁生产的使用；
- b) 资源有效制造的创新方法；以及，
- c) 工业共生模型¹⁹。

24. 上述战略是互补的，可以纳入其他相关的现有政策领域，例如可持续消费和生产政策，环境或废物管理政策，或可以组成一个独立的废物产生预防和最小化国家战略。如果设计得当，辅之以补充措施，经济手段可以非常有效地促进废物产生预防和最小化，应予以考虑。

25. 在第 1.6 节中，概述了废物产生预防和最小化可能的好处。更具体地说，可以确定关于上述战略赞成或反对的论点。例如，诸如意识运动的信息策略可以警告人们需要通过再利用产品或改变他们的消费行为来最小化废物。然而，这样的活动可能不总是导致行为改变或其他期望的改变。另一个例子是制定可能通过设计转变生产的法规，但是应当避免或平衡公司、消费者以及当局的行政负担过重，而不是只关注于既定目标的预期成绩。

¹⁶ 为产品标记独特标签，以便消费者知道其制造符合公认的环境标准。

¹⁷ 政府当局行使购买力，选择环保的商品，服务和工程，从而对可持续消费和生产作出重要贡献。也称为绿色采购。定义摘自欧盟政府绿色采购政策http://ec.europa.eu/environment/gpp/index_en.htm。

¹⁸ 设计产品或服务，以尽量减少对环境的影响。生态设计适用于产品生命周期的每一个阶段：原材料提取，生产，包装，分销，使用，回收，循环，焚烧等。定义摘自世界可持续发展工商理事会www.wbcsd.ch。

¹⁹ 例如，一个实体提供残余物或副产物用于另一个实体的原材料。也被描述为两个或多个工业实体发展互利关系的举措(<https://sustainabledevelopment.un.org/>)。

1.5.2. 各部门的方法

26. 废物产生预防和最小量化战略来源于废物管理部门。但是，其范围覆盖了整个经济和一个国家使用的所有物质流和产品，从它们各自的来源到处置。因此，全面的废物产生预防和最小量化战略不仅应涉及废物管理部门，还应涉及采矿部门和其他生产行业、设计师和服务提供者、公共和私人消费者。

27. 战略可以覆盖所有部门并以一般方式进行预防和最小量化，但某些部门可能受益于特定的办法。

28. 通常与可能受益于特定战略的危险废物和其他废物相关的部门包括住建、建筑/基础设施、制造业、私人服务活动/酒店、销售、零售和运输部门以及采矿和原始原材料加工部门。

29. 关于资源效率的一般行动可以包括其他部门，因为其减少了对原始资源的需求。例如，预防和最小量化建筑废物可能会减少采矿部门对新采石料/石料的需求。

30. 废物产生预防和最小量化影响并取决于广泛的利益相关者，涉及到各种活动，并且可能在一些特定的废物流中实现。在尝试覆盖尽可能广泛的受众时，有必要考虑具有类似消费模式并可通过特定渠道定位的某些利益相关者群体。一般来说，旨在促进防止和最小量化废物的方法原则上首先落脚点在于政府一级，然后在企业和私人的废物产生层面进行，以从源头上防止和最小量化废物。²⁰

A. 政府

31. 为了在其各自的国内环境中贯彻废物产生预防和最小量化，各国政府应确保在其立法和监管框架、基础设施和机构中提供和纳入某些政策。在国家一级，各国政府可采取以下措施²¹：

- a) 制定关于废物产生预防和最小量化的综合政策，包括关于生态设计、应急准备和绿色采购²²战略的条例和政策；
- b) 制定综合废物产生预防和最小量化战略；
- c) 组织关于废物产生预防和最小量化的公共和企业教育及提高认识运动；
- d) 根据最佳可行技术（BAT）和最佳环境实践（BEP），制定有关设施的指导工具，用以防止和最小量化废物；
- e) 制定和实施经济手段，例如：促进和刺激源头分类的价格激励、设施的税收激励、清洁消费激励，认可或奖励，以及
- f) 与相关行业、协会、研究机构和其他利益相关者合作，在废物产生预防和最小量化方面建立公私合作关系。

B. 商业和工业

32. 在产品生命周期的概念和生产阶段，涉及商业和行业利益相关者做出的决策，决定了产品在整个生命周期中对环境的影响。设计师和制造商防止和最小量化浪费的机会是巨大的，具体通过：

- a) 在可行的情况下实施工业转换过程，进行生态或清洁设计和生产；
- b) 在服务的生产和运输环节中，将研发和设计置于生产和创新之前，特别是整个生命周期的影响评估，以及重复使用、修理、拆卸（适当时）、回收和再循环的综合设计；
- c) 扩大现有的环境管理系统以涵盖废物产生预防和最小量化政策、方法和报告；
- d) 改变采购和消费模式，以采购更绿色、更少浪费或毒性更小的产品；
- e) 促进和易化再利用和再准备的准备，例如：为再利用和再准备的准备进行修复以及制定质量标准 and 手册；
- f) 提供关于废物产生预防和最小量化方法和技术的可获取信息、教育和培训，以及
- g) 行业和政府之间关于废物产生预防和最小量化的协定或伙伴关系。

²⁰ 欧盟废物预防指南，见

<http://ec.europa.eu/environment/waste/prevention/pdf/Waste%20prevention%20guidelines.pdf>.

²¹ 欧盟废物预防指南，废物预防实用手册（见文件UNEP/CHW.13/4/Add.1附录1）及有害废物和其他废物的环境无害化管理框架。

²² 利益相关方行使购买力以选择环保的商品、服务和工程，从而为可持续消费和生产做出重要贡献。

C. 住建

33. 家庭在产品生命周期的消费阶段产生特定的废物，例如：食品废物、废纸、废塑料袋和其他包装废物、废电池、废旧电气和电子设备（WEEE）、废旧家具、废弃衣物等。存在可以延长许多家用产品寿命的方式。例如：通过制定或扩大关于再利用和再制造准备的倡议和活动，同时也可以通过：

- a) 传播信息和宣传运动，提高对家庭废物产生预防和最小量化的认识；
- b) 采取行动预防和最小量化废物，例如：通过实行诸如现收现付制（PAYT）计划和生态设计要求的相关政策和要求，改变减少家庭废物和参与相关计划的行为。

1.5.3. 关于“产品中的化学品计划”

34. 在预防和最小量化战略中，可以与产品中的化学品（CiP）计划建立联系。²³这是一个提供关于在联合国国际化学品管理战略方针（SAICM）框架内制定的产品中有害物质信息的全球计划。CiP 计划面向企业，特别是涉及产品生命周期并正在为产品中化学品信息交换寻求引进改进和高效程序的制造商、组织和其他利益相关者。CiP 计划的目标是让利益相关者可以获取到产品中的化学品信息，以帮助其做出决定并对化学品暴露、风险和管理采取适当行动。

1.6. 废物产生预防和最小量化的益处

35. 废物产生预防和最小量化有助于保护人类健康和环境，提供可持续解决方案，鼓励良好的社会经济和商业实践，并有助于更好地了解与废物相关的环境和健康风险。特别地，废物产生预防和最小量化有助于：²⁴

- a) 保护人类健康和环境：预防和最小量化废物（特别是危险废物）的可持续和环保方法将减少资源开采、制造和分配对环境的影响，并有助于减少全球变暖，例如诸如填埋场释放的甲烷和焚烧产生的二氧化碳等温室气体排放。另一个例子是通过替代被归类为臭氧消耗物质（如：氟氯烃和哈龙）的化学品，改善公共卫生条件。
- b) 高效生产实践：通过节省能源和减少材料使用，以及促进开发和使用更清洁的工艺和技术，预防和最小量化废物将提高资源效率。
- c) 经济回报：更有效的产品使用将降低购买新材料和能源消耗的成本，并获得更高的产品自然资源投入产出比。
- d) 可持续消费模式：废物的预防和最小量化促进国家目标和地方当局的参与。它还刺激商业/消费者态度和行为的根本变化，以及工业过程和产品设计中的新范例。

2. 实现废物产生预防和最小量化的规划策略

2.1. 准备 / 开始

36. 有三个主要因素有助于废物产生预防和最小量化战略的成功：

- a) 对废物产生预防和最小量化的多重优势的明确和简明的战略观点；
- b) 包括高级别决策者的相关决策者以及感兴趣和受影响的利益相关者对实施战略的承诺；以及，
- c) 现有知识和信息的质量，包括定量和定性数据。

37. 因此，应该采取以下四个步骤来开始制定废物产生预防和最小量化的战略：

- a) 建立总体战略视图：
 - i. 突出“快速取胜”等优势；以及，
 - ii. 确定中长期目标。
- b) 建立一个项目小组，包括：
 - i. 相关决策者；
 - ii. 进行技术/社会经济分析，项目组织和车间管理的专家，以及，

²³ 更多信息见：<http://www.saicm.org/Default.aspx?tabid=5473>。

²⁴ 《欧盟废物预防指南》：<http://ec.europa.eu/environment/waste/prevention/guidelines.htm>。

- iii. 利益相关者一方面代表广泛的意见、关切和利益，另一方面愿意确定共同点并为废物产生预防和最小量化做出贡献。
- c) 建立一个知识库：
 - i. 材料和废物流动的历史性和预期的未来发展及其环境影响；
 - ii. 材料使用的效率、潜在的效率提高和阻碍改进的生态/技术/经济/社会障碍；以及
 - iii. 克服这些障碍及其有效性的手段。
- d) 制定一项业务计划，其中：
 - i. 设定时间表；
 - ii. 对各项活动分别进行预算；并且，
 - iii. 识别并向各利益相关者分配任务和责任。

38. 项目团队的规模应足够大以涵盖广泛的意见和兴趣，但同时足够小到允许讨论和整合意见。利益相关的专家不必表明其组织的官方意见。他们应该用自己的专家观点。但是，他们应该是各自组织的意见领袖。

2.2. 情况评估

39. 在评估情况时，可以考虑以下几个步骤：

a) 初步评估

使用关于废物/废物产生预防和最小量化的现有数据对当前废物产生预防和最小量化性能进行初步评估是一个重要的起点。在测量废物产生预防和最小量化方面存在明显的困难，但某些统计数据在确定目标的进展情况方面是可靠的。以下统计数据有助于评估废物产生预防和最小量化的现状以及创建基线：

- i. 每人收集的废物数量，每人产生的危险废物数量；
- ii. 公众对预防和最小量化废物的意识和行动；
- iii. 使用废物产生预防和最小量化服务，例如：维修和再利用中心、家庭堆肥；
- iv. 生态标签产品的消费；
- v. 现付现金计划（PAYT）计划所涵盖的公民百分比；以及
- vi. 生产者责任计划涵盖的产品。

b) 信息收集

除了废物循环数据外，还应收集关于国家人口、社会经济特征、可用基础设施、现有废物管理系统、再利用机会以及贸易和制造活动的信息。

c) 政策分析

关于国家、区域和地方各级现有政策的分析对于确定哪些政策正在发挥作用和确定尚未解决的主题领域至关重要。到目前为止，所采用的举措范围及其结果应在评估哪些方面在当地有效，以及应扩大哪些方面时予以考虑。例如，在扩大这一政策领域之前，现有生产者责任政策的清单是至关重要的。可能有机会在不同行政级别的废物产生预防和最小量化战略之间建立伙伴关系，并发展区域战略之间的协同作用。在这里也应该考虑措施、现有措施的意想不到的后果和现有基础设施和服务的竞争之间的权衡。

d) 确定变革的关键障碍和驱动因素

国家当局通过确定其国家特有的废物产生预防和最小量化行为变化的关键障碍和驱动力，将有所获得，因为这些将有助于指导选择已实施的措施。

e) 利益相关者的参与：如何和何时

从一开始，利益相关方的参与对于收集数据和评估已经使用的措施至关重要。通过启动正式磋商，参与现有的废物产生预防和最小量化活动或相关领域的利益相关者将被识别或自我识别。磋商的参与者将是战略制定的后续阶段的关键资源，它们的持续参与将确保所设计的战略是相关、有用和可实现的。

2.3. 设置优先处理事项

40. 当局在制定废物产生预防与最小化总策略的最初阶段时应该明确他们的整体方法、参与机构以及战略目标。该阶段当局同样应该进一步明确该策略的战略构想以及废物产生预防与最小化策略如何适应并促进循环型社会。

41. 下述各部分为战略构型阶段明确优先处理事项、范围与目标提供指导。

2.3.1. 范围

42. 明确该废物产生预防与产量最小化策略是否属于国家或地区整体废物管理策略或环境战略的一部分，或指出该策略独立执行。

43. 明确该策略是否通过以下方式达成废物产生预防与最小化目标：

- a) 关键利益相关方(如：家庭、商业)；
- b) 废物流 (如：生物可降解垃圾、纸类废物、危险废弃物)；
- c) 生命周期的阶段(如：设计、生产、消费)。

2.3.2. 关键利益相关方

44. 当制定废物产生预防与最小化策略或确定具体的机构与措施时，建议明确关键的利益相关方，如：

- a) 消费者，或具体来说，家庭；
- b) 明确具体的工业部门非常重要。该过程通过确定设计阶段与废物管理阶段中重要的工业参与者；
- c) 工人和工会；
- d) 当地机构；
- e) 致力于此的非政府组织；
- f) 学术界；以及，
- g) 其他相关参与者，如再利用中心、学校等。

2.3.3. 废物流

45. 当某种废物流占整体的废物量相当大的比例或可以被简单有效处理时，单独明确该废物流将十分有效。该废物流占废物总量的比例在国内环境的基础上基础上下浮动。因此，在设定有效处理事项之前首先分析废物的产生情况十分重要。下文将讨论各种废物流。解决这些废物的最使用的策略同样在下文中列出。更多信息可以在本文件附件和《巴塞尔公约》²⁵网站中找到。

2.3.3.1. 有害废物

46. 有害废物可能来自工业与生活。通常在发展中国家与经济转型期国家，有害废物的管理可能不足或不恰当。即使有些国家已经拥有管理有害废物的体系，应该注意到的是，恰当的管理结构应该关注追求其切实相关的环境、经济和社会效益。

2.3.3.2. 电子废物

47. 电子电器废物或称 **e-waste** 是正在快速兴起的废物流。截至 2014 年，已经有四千二百万公吨的电子废物产生，其中只有部分被循环或回收²⁶，其中三千万的电子废物被运往拉丁美洲、亚洲和非洲的发展中国家²⁷，而这些国家没有适当的法律或设备来管理这些废物。

48. 电子电气废物在发达国家通过法律手段进行管理，如欧洲指令 2012/19/EU 中对电子电器设备（WEEE）的规定²⁸，该规定与其他规定共同设定了收集、回收、循环和准备电子电气设备再使用的目标。

²⁵

<http://basel.int/Implementation/CountryLedInitiative/EnvironmentallySoundManagement/ESMToolkit/Guidanceonwasteprevention/tabid/5844/Default.aspx>。

²⁶ 根据联合国大学 (Balde et al. 2015; UNODC 2013) 出版于 “Waste Crimes-Waste Risks: Gaps in Meeting the Global Waste Challenge” (UNEP, 2015)。

²⁷ <http://www.nature.com/news/take-responsibility-for-electronic-waste-disposal-1.20345>。

2.3.3.3. 卫生保健和医疗废物

49. 卫生保健和医疗废物包含不同种类的废物，包括无害的、易传染的、致病的、化学性质的、医疗性质的甚至放射性废物。在医疗活动所产生的废物中，和生活废物比较，85%是普通的无害废物。剩余 15%的废物则是有害废物，可能具有传染性、毒性或者放射性²⁹。主要的卫生保健废物源头包括：

- a) 医院和其他健康设施；
- b) 实验室和研究中心；
- c) 停尸房和解剖中心；
- d) 动物研究和测试实验室；
- e) 血库和收集设备；以及，
- f) 养老院。

50. 有些废物产生预防与最小化措施与卫生保健和医疗废物有关。

2.3.3.4. 汞废物

51. 汞天然存在于地壳中，但人类活动如采矿和化石燃料的燃烧使得汞污染发生扩散。考虑到 BAT、BEP 水俣公约中关于汞的规定以及巴塞尔公约的相关条款，对汞废物的处理应该使用无害方式进行，其中水俣公约的目标是保护受人为排放和释放汞及汞化合物干扰的人类健康与环境。

52. 除此之外，UNEP 设立了全球汞伙伴项目，该项目旨在通过最小化与最终消除全球范围内汞在大气、水与陆地的人为排放进而保护受汞及其化合物的释放影响的人类健康与全球环境。

2.3.3.5. 包装废物

53. 包装指用于盛装、保护、运输或提交货物的材料，生产者或消费者运用这些材料使自然装填的物品成了可以进行买卖的货物。包装通常分为三大类：主要包装指包装产品所用的基础材料，二类包装指聚集货物的材料，而三类包装指运输与处理所需要的材料。包装材料可能在供应链的所有环节上产生，但主要产生者仍为供应链末端即消费者。由于三类废物在全生命周期的具体环节中产生，且涉及多个利益相关方，因此关于包装废物的政策可能会对第三类废物进行强调，规定独立措施。

2.3.3.6. 塑料类废物

54. 塑料因其良好特性正在被多种产品中大量使用，而塑料类废物也是正在兴起的废物流。自 1964 年到 2014 年，塑料的使用量增加了 20 倍，使用量达 3.12 亿公吨。根据预测，未来 20 年间，塑料使用量将翻一番。估计得出，只有 14%的塑料废物通过收集得到循环，而 2.67 亿公吨的废物都采取了填埋、然后或倾倒入自然环境中的处理手段，其中有八百万公吨的塑料最终流入海洋。³⁰ 近期，关于塑料的大量行动正在积极开展，如对建立新的塑料经济的提议³¹，与即将在 2017 年出版的欧盟塑料废物战略³²。这些行动建立在循环经济的概念之上。

2.3.3.7. 纸质废物

55. 纸质废物的产生来源主要是家庭、办公生、商业和组织单位。属于该废物流的产品普遍存在且易于区分，如丢失的邮件、登记簿、办公室纸张、报纸和杂志。在生活垃圾中一种重要的纸质废物，即大量的垃圾邮件，可以通过实行综合的、易于开展的、广泛宣传的自愿项目与信箱标签被邮政服务部门标注以示奖励的强制项目。更有效的使用纸张和进一步向电子文件过渡是可以有效减少纸质垃圾与纸张使用的方式。减少墨水中的有害物质是降低对人类健康和环境危害的另一种方式。

²⁸ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0019>.

²⁹ <http://www.who.int/mediacentre/factsheets/fs253/en/>.

³⁰ 见

https://www.ellenmacarthurfoundation.org/assets/downloads/publications/EllenMacArthurFoundation_TheNewPlasticsEconomy_19012016.pdf.

³¹ Ibid. World Economic Forum/Ellen MacArthur Foundation.

³² http://ec.europa.eu/environment/waste/plastic_waste.htm

2.3.3.8. 可生物降解废物

56. 可生物降解废物从植物或动物身上而来，因其可以被生物降解的特性而被列为一类。可生物降解废物包括食物碎屑和园林垃圾。绝大多数社会成员都会产生可生物降解废物，为减少该类废物提供了很多潜在机会。餐厨垃圾可以仅通过简单的方式如煮沸，提供珍贵的动物饲料。其他减少可生物降解废物的方式包括减少粮食损失或园林垃圾。

2.3.4. 生命周期阶段

57. 废物产生预防和最小化可以在某种产品或材料的任何生命周期阶段实行。应该对每一阶段的具体措施进行确认，并根据 BAT 和 BEP 考虑其对废物产生预防与最小化的作用。³³

58. 一种产品的设计对其包括废物阶段的生命周期有显著影响。体现在产品的制造阶段，即废物可以被避免而材料损失可以减少。在产品的运输和消费过程中同理，举例来说，聚焦于某种产品的服务功能而不是单纯的卖掉它，可以减少或避免不必要的运输包装。

2.3.5. 目标

59. 在废物产生预防与最小化战略中，应该考虑将经济增长与环境影响解耦的整体目标。在这个框架中，伴随着明确截止日期的量化目标对于向废物产生预防与最小化的态度和实践转型或向更有效的材料管理转型有相当作用。

60. 在这种背景下，某种废物流的减少可能与废物产生预防与最小化的战略无关，而是与结构 and 经济趋势相关。战略目标的设定应考虑到现存的废物产生趋势与现存的有助于协助当局等实现既定目标的设施和服务。协调利益相关方对于潜在目标的期望对于实现研制和实施战略的成功有重要的作用。

61. 任何对于目标及其实施的评估应该是相互独立的。为得到利益相关方的支持与参加，这些评估应具有可信性。

62. 下列步骤可能有助于确定合适的目标：

a) 目标的地理范围

目标可能针对全国范围、某区域或当地。具有强约束力的区域性政府机构的地区可能在该层次上实行废物产生预防与最小化战略。高标准的国家目标与有力的宣传活动可以为采取的措施带来关注，并促进对于废物产生预防与最小化数据的收集。

b) 定量或定性目标

定量目标，如减少废物收集的数量或提高公众的意识，适于在各地区层面设立。计量结果则应该采取测量废物减少数量或（与）温室气体排放的方法。对于废物总量来说，没有废物减少量与温室气体排放减少量的固定比例。减少一吨铝制品与减少一吨建筑材料对温室气体减排的贡献差别很大。

当目标为某类难处理的废物流时，定性目标非常适用，如工业与商业中预防有害材料的制造和使用与减少生产过程中有害物质的含量。

c) 收集数据

设定任何一种目标时，都应考虑用以评估结果的数据是否可得：该数据是否在国家、地区或当地层面存在，若不存在，收集数据是否存在困难。

d) 时间框架

应考虑整体战略和具体行动的时间框架，同时应考虑该时间框架与其他相关行动与战略的联系。除此之外，应考虑该时间是否可以完成既定目标。另外，应考虑长时间框架的高水平目标与短时间框架的低水平目标哪种更适于国家战略的宏观思路。

e) 自愿和强制的目标与工具

应通过自愿合同、对部分部门的强制要求与罚款共同实现既定目标。

f) 总体目标与具体目标

³³ 见 <http://www.ciwem.org/wp-content/uploads/2016/02/Less-is-More.pdf>.

总体目标可能包括减少废物填埋与回收的数量或通过废物管理减少温室气体的排放量（以百万吨二氧化碳当量为单位）

63. 由于产生的废物不同、数据收集与培训的方式不同，分部门的专门目标可能分别具体到家庭与商业。总的来说，目标关注的部门越小，得到的测量数据越精确，开展活动所影响的人员比例也越大。

64. 设定的目标可能通过关注宣传活动与强制措施的手段对废物流进行重点的规定。纸质废物、包装垃圾、电子和电气废物、可生物降解废物与建筑和装修废物都分别有其专门的目标。

2.4. 明确实施措施

65. 由于废物产生预防与最小化战略的实施通常需要较长时间保证，为保证长期的供给充足，该阶段应列举所有所需必要资源与资源激活机制。

66. 不同的废物产生预防与最小化战略需要不同的实施措施。为确保长期战略的成功，国家驱动的战略需要精确的预算。而参与各方则需要共同或各自的目标下实施各种不同手段。

67. 此处建议，为促进废物产生预防与最小化，由新的国家（或地区）废物所可能创造的机会应事先录入³⁴。

2.5. 建立废物产生预防以及最小量化策略

68. 这部分包括了如何制定措施以保证策略非常适合国家或区域的特殊情形并且确保策略能够得到广泛的接受和参与。

69. 利益相关者的参与对策略的成功以及目标的实现至关重要。此过程中，早期参与很重要，以保护策略的所有权。利益相关者可能采取的行动如下：

- a) 在发展阶段邀请关键利益相关者参加集体讨论会议或工作组；
- b) 确认各部门以及各管理层面涉及到的利益相关者：这可能包括：相关的政策制定者，地区和地方当局，社区，非盈利组织，研究人员，行为改变专家，商业和工业的专业人员，贸易组织，和消费者团体；
- c) 确认关键利益相关者应起到的作用：咨询委员会或部门工作小组，包括所有有关的关键利益相关者，可以在利益相关者和公共机构之间进行最好的互动。但是由于这种委员会或者工作小组可能非常耗时且成本高，判定此种类型的参与是否对所有的活动都有帮助就十分重要。这种评估最好在确认实施方式的阶段进行；
- d) 考虑是否有必要为关键利益相关者规定永久或暂时的职能；
- e) 考虑在策略设计阶段应当咨询哪些其他利益相关者；以及，
- f) 考虑在被提议的策略的发展过程中公众可能如何参与。

70. 以下列出了一些从政策一体性和连贯性角度出发、在建立废物产生预防及最小量化策略时可能帮助确认机会的实际问题：

- a) 在所讨论的国家可能采取的首要策略或政策中，比如可持续发展策略，国家环境政策以及/或者废物管理计划，相关的优先级如何？
- b) 哪些政策领域正在被修订或发展建立（或者将很快被修订或发展）以及在这些领域对于废物产生预防及最小量化各方面的整合存在哪些机会？在现在以及将来，会有哪些瓶颈阻碍策略的实现？
- c) 哪些机构负责相关的政策领域？在这些领域已经制定了哪些相关的策略和行动计划以及在它们规定的对象、目标以及指标中，与废物产生预防及最小量化相关的有哪些？是否有机构或者部门需要能力建设或技能发展？
- d) 这些不同的政策领域将如何促进废物产生预防及最小量化目标的实现？哪些个别的政策在受关注的领域已经到位以及在将废物产生预防及最小量化的各方面整合至这些政策中时存在哪些缺陷和机会？哪些技术是相关的、可获得的并支付得起的以及哪些需要进一步发展？
- e) 使某一特定废物流或产品种类连贯的政策是否到位？这些已经实施的政策中有哪些阻碍了废物产生预防和最小量化？
- f) 在相关的政策之间进行协同增效并提高其一致性时存在哪些机会？需要进行哪些权衡取舍？对于相关政策的后续修改和修订存在哪些机会？

³⁴ 例如，为建立像在UNEP/POLAC协调下在拉丁美洲和加勒比地区推行的废物和化学品普通法和针对废物和化学品的区域性提案那样的法律和提案所做出的努力。

g) 由商界、民间团体或学术界提出的哪些相关提议已经就位以及其中哪些提议能够得到政府政策的支持？

71. 本指导文件提供了在制定战略时可供参考的最佳实践和废物预防及最小化策略的因素示例。

72. 在废物产生预防及最小量化策略实施过程中可用于提升政策整体性和连贯性的方法包括：

a) 负责发展制定废物产生预防和最小量化策略的专家组或委员会应当安排会议或者建立小组以讨论和探索整合政策及提升政策一致性的机会。此项工作的最终目标应当为设计一个工作计划，此计划应具有战略目标和针对政策整合和提升政策一致性（环境、经济、社会等）方面的监督机制。此工作计划应当就短期、中期和长期的政策整合工作重点清晰地确认政策领域并且建立废物产生预防和最小量化策略中心。

b) 将废物产生预防及最小量化的各方面整合至其他政策领域的一个主要工具是影响评估。因此建议相关的影响评估指南和训练应当包括废物产生预防和最小量化议题。

c) 国家可持续发展策略也是政策整合的一个重要工具，因为他们通常关联了很多相关的政策领域并以实现可持续发展为最终目标。因此废物产生预防和最小量化的主题应当能在任何国家可持续发展策略中被清晰地识别。

2.6. 采取策略

73. 策略草案一旦建立，即应开展批判性的分析以保证其目标得到实现。应当通过相关的渠道争取策略的采纳与实施。例如，政府可能向议会提交策略以使其得到采纳。

74. 应当建立一个程序以定期回顾并调整策略。

2.7. 实施策略

75. 基于在上述 2.3 部分（设置优先处理事项）选择的总体方法，当局应当根据策略中包含的行动和措施确定这些措施应当在何种层面实施。

76. 应当商定一个展示不同阶段预期的持续时间和策略预期结束日期的时间框架。此时间框架应当着重关注废物产生预防和最小量化策略的不同阶段。

2.8. 监督进展

77. 在追踪进展和确保任何策略、计划或措施的透明度和可信度的过程中，应当确定谁将开展追踪工作以及可能采取何种核查机制。

78. 可能的监督方法包括：

- a) 自我监督并定期报告；
- b) 政府监督和报告；
- c) 通过评审和认证计划由第三方监督；
- d) 综合上述方法也是一种可能的方式。

79. 与测量回收的废物或送至填埋场的废物相比，测量“预防的”废物通常具有其固有的难度。另一个问题在于如何确认在某一废物流中与废物数量（如吨数）相关的不同环境影响。

80. 因此建立指标和基准对于追踪目标实现的进展和评价废物产生预防和最小量化策略的功效至关重要。

2.8.1 废物产生预防和最小量化指标的背景

2.8.1.1 废物产生预防和最小量化指标的主要目标

81. 评估废物产生预防和最小量化的指标应当允许当局、商业机构和公众做到如下几点：

- a) 确认处理的废物流的优先级；
- b) 监测政策目标实现至何种程度。

82. 废物产生预防和最小量化指标应当测量和展示某些行为（如食物消费、住房建设活动）整个生命周期中的原料和废物强度是否在一段时间内获得了改进。此外，基准对于建立比较基线或基准点来说具有重要作用，这些基线或基准点使国家或者组织能够与最佳行动进行比较以确定自身表现。

2.8.1.2 现有状况

83. 我们需要废物产生预防和最小量化指标，但在国际范围内尚未存在被广泛接受的模型。目前在地方层面或者少数国家层面出现了越来越多针对不同废物流、采用多种方法论的提案。通常每年每人或每个家庭废物产生、废物回收和废物填埋的吨数以及国内生产总值（GDP）数据为开展分析提供了初始基础。

84. 如果策略中包含量化目标，那么通常在同一时间制定指标。如果不能定义量化的指标或需要将目标制定得更精确，用以展现定性或定量目标是否实现的指标对于监测所采取策略的实施进度具有重要作用。需要注意的是废物年产生量的变化可能由多种因素导致，包括人口和GDP的变化。与之类似，废物量的减少也不能直接归因于废物产生预防和最小量化行动。

2.8.1.3 有效指标的制定原则

85. 有效的指标应当关注清晰定义的废物流，并使用一个可被接受的协议进行衡量。为监测进展而制定的指标应当尽最大可能满足以下几点：

- a) 相关（就测量废物产生预防和最小量化结果的目标而言）；
- b) 被接受（尤其是为目标利益相关者接受）；
- c) 可信（指标使用者和利益相关者对指标的信任程度）；
- d) 简单（主要指定量化和后续跟进过程中的数据可获得性，以及与目标群体的交流）；
- e) 稳健（主要指数据质量、适用范围和代表性）。

86. 在某些情况下需要不止一个指标来监测目标。

2.8.1.4 废物产生预防和最小量化指标的类型

87. 指标可按照如下方式进行分类：

- a) 描述性指标，描述一个变量随着时间的发展变化，如果此变量以绝对标度展现。典型的此类指标有状态、压力或影响指标。
- b) 性能指标，通常用于展示与目标的距离。典型的此类指标包括明显与应对政策关联状态、压力或影响指标；例如测量与基础年份或分流目标相比的可降解废物填埋量的指标。
- c) 效率指标，与压力动机相关。这些指标以资源、排放和每单位产出对应的废物的形式提供产品或加工过程效率方面的信息。
- d) 政策有效性指标，关联环境变量的实际变化和政策努力。据此，它们关联了响应指标和状态、压力、影响指标。

88. 另一种对指标进行分类的方法是采用“压力-状态-响应”模型，此模型由经济合作与发展组织（OECD）创建³⁵：

- a) 压力指标，包括物质流分析（MFA）指标，“总废物产生量”，“直接物质输入”和相对压力等，这些指标通过绘制GDP或者人口对应废物产生量的图表来展示；
- b) 状态指标，测量废物对环境因子例如空气、水和土壤质量的影响的变化情况；
- c) 响应指标，测量引入的策略或政策对废物产生的影响。

89. 以上列举的指标可能会被综合使用。

2.8.2 举例说明针对三种废物流的指标

2.8.2.1 家庭垃圾的废物产生预防和最小量化指标

90. 家庭废物产生预防和最小量化指标应当体现某些家庭活动（例如食物或耐用品消费）是否在其生命周期中在物质和废物强度方面有所改善。指标也应当体现那些激励废物产生预防和最小量化的有效政策是否已经被采纳。以下核心要素可被用于创建不同的指标以监测实施进展以及在不同的国家和地区之间进行比较：

- a) 用吨数表示的总废物产生量（最好不包括庭院废物）；
- b) 在所选择的消费类别的家庭支出；
- c) 总户数和单人家庭户数；

³⁵ 见Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997; <https://stats.oecd.org/glossary/detail.asp?ID=2105>.

d) 激励计划覆盖的家庭户数，例如PAYT计划。

91. 这些指标展现了家庭的典型功能是否以更少的废物产生量达成以及住户是否响应了不同的政策措施，将提供有关日常家庭活动的废物强度方面的信息。

2.8.2.2 可生物降解废物的预防与最小量化指标

92. 可生物降解废物的预防和最小量化指标应当衡量并展示针对可生物降解产品生产和消费的社会行为是否在其整个生命周期中在物质和废物强度方面有所改善。

93. 首先，基于数据可获得性和综合最易获得的和最想要的指标的考虑，建议应用组合以下核心要素，以包含与动机相关的压力并酌情测试政策响应的影响：

- a) 食物产品消费；
- b) 餐厨垃圾产生量（不包括食品行业）或者家庭可生物降解废物产生量；
- c) 总户数和单人家庭户数。

94. 通过使用这三个核心要素，我们可以创建若干不同的指标以监测实施进展并在不同的国家和地区之间进行比较。这些指标体现了来自家庭的食物和生物废物的数量是否通过减少购买未经使用即被处置的食物从而减少，将提供家庭生物废物强度方面的信息。

2.8.2.3 建筑垃圾的废物产生预防和最小量化指标

95. 下列核心要素可以形成若干不同的指标的基础，这些指标用以测量和监督建筑废物产生预防方面的实施进展并使国家和区域之间的比较成为可能：

- a) 建筑材料的国内开采；
- b) 产生的建筑垃圾；
- c) 建筑部门的活动。

96. 这些指标能体现目前进行中的建筑活动与该部门提供的经济或物质功能相比是否以使用更少材料及产生更少废物的方式开展，从而提供建筑行业废物强度方面的信息。

Annex to the guidance*

Good practices and examples of elements for waste prevention and minimization strategies

Outline for presenting practices and examples

In this annex, good practices and examples of waste prevention and minimization strategies are provided in order to give practical information and concrete elements for developing similar strategies or measures.

The practices and examples in this annex are provided following the same structure in order to give the core elements of information for every example or practice. Where information on the core elements was either not relevant or not available, the respective section is not included for the example or practice in question. For more detailed or in-depth information, reference is made to useful documents, websites, etc.

A. Sectoral or target group approach: good practices

1. Eco-design requirements

Description and status of the measures or programme:

Legally binding eco-design requirements aim at setting benchmarks for products' environmental performance, as relates to both energy and resource efficiency.

These requirements may be imposed in legal instruments such as legislation, regulations or administrative decisions. Eco-design requirements may also be based on voluntary implementation with appropriate incentive structures to support their uptake.

For such eco-design requirements, the EU Directive 2009/125/EC establishes a framework for the setting of eco-design requirements for energy-related products (the Eco-design Directive¹) and is provided as example.

Duration:

Due to technological and scientific progress, requirements may need to be updated or adapted over time. Adequate revision clauses are included in the specific regulations to ensure that they reflect accurately development in the market. A tiered approach may also be used to gradually tighten requirements following market development.

Approach:

Usually a certain product group and, through that a certain industrial sector, is targeted. Under the Eco-design Directive, implementing measures (mandatory minimum requirements) can be set for energy-related products defined as any good that has an impact on energy consumption during use which is placed on the market and/or put into service, including parts intended to be incorporated into products covered by the Directive.

Baseline for this case:

Energy-related products account for a large proportion of the consumption of natural resources and energy in the European Union. They also have a number of other important environmental impacts. In the interest of sustainable development, continuous improvement in energy use as well as in the overall environmental impact of those products should be encouraged.

Goals and/or targets:

The goal of the EU Directive itself is to contribute to increased energy efficiency, security and savings and help reach climate policy goals and the implementation of the circular economy.

Stakeholders involved:

According to a work plan, preparatory studies are conducted on a product group basis. The preparatory studies assess if and what type of implementing measures (including energy labelling) would be appropriate. Stakeholders from research institutions, the industrial production and/or distribution sector related to the product group, environmental NGOs and government experts are invited to

* 为缩减成本，未翻译本文件的附件。

¹ http://ec.europa.eu/growth/industry/sustainability/ecodesign_en.

participate in this process and to provide technical or other input, allowing for exchange of knowledge and views.

Means of implementation:

The implementation of the requirements is taken up in the first instance by the producers of the involved product group. But it is for verification authorities to ensure that products allowed on the market comply with the criteria. Criteria should be set so that there is no significant impact on consumers, in particular as regards the life-cycle cost of the product, and no significant negative impact on the functionality of the product, from the perspective of the user.

Challenges and incentives:

With the European Commission's action plan on the circular economy there has been increased focus on the contribution to the circular economy.² While for some product groups requirements have been established, it has proven more difficult for other product groups to set requirements to ensure better material efficiency, particularly since these should be enforceable and verifiable. For this reason, among others, the European Commission issued a standardisation mandate to CEN,³ CENELEC⁴ and ETSI⁵ under the Eco-design Directive to develop horizontal standards for material efficiency. Such standardisation should, in the future, make it easier to address issues such as recycled content, modularity, repairability and durability.

Monitoring of implementation and performance:

The existing measures are monitored by competent member States' authorities that monitor the placing on the market of goods.

Available information (reports, policy documents, etc., including hyperlinks to online material):

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02009L0125-20121204&qid=1480602324623&from=EN>

2. Promotion of eco-design through the provision of tools

Description and status of the measures or programme:

Designers and other actors involved in the first phases of the life-cycle of a product can be stimulated to voluntarily incorporate eco-design principles when designing and marketing new products. By providing them with tools to calculate the environmental impact of the products they design, or tools to provide suggestions on material use or alternative systemic approaches, they will be incentivised to further find their own way in the design of their products, services and even systems.

Approach:

Usually a certain product group and through that a certain industrial sector is approached.

Baseline for this case:

Informing involved stakeholders on the options and potential of substitute materials, on more efficient use of materials and on modulating design, accompanied by standardizing this information puts designers on track to develop products in a way that materials are more efficiently used and waste is eventually prevented.

Goals and/or targets:

An example that was developed in the Flanders region of Belgium is the Ecolizer, which at first was a paper tool, but is now also digitally available online. The website (www.ecolizer.be) aims at quickly and easily calculating the environmental impact of a product.

Stakeholders involved:

Typically eco-design is promoted for designers and students following training in design or product development. The intention is that the eco-design experiences of these designers then flows back to update existing tools and develop new tools.

Challenges and incentives:

It appears that designers, through their training or through tools like the Ecolizer, become increasingly aware of the added value of eco-design and are incorporating it in the products they design. It remains,

² See http://ec.europa.eu/environment/circular-economy/index_en.htm.

³ <https://www.cen.eu/Pages/default.aspx>.

⁴ <https://www.cenelec.eu/>.

⁵ <http://www.etsi.org/>.

however, a continuing effort to provide insight into the resulting benefits or added value, and to make this information available to designers and companies.

Evaluation:

A tool like the Ecolizer, or the provision of good practices and eco-design examples, have proven to cause behavioural changes in a certain group of designers and producing companies. Merely promoting the concept however will not cause a paradigm shift towards more widespread eco- or even sustainable design. Binding requirements seem indispensable and inevitable.

Available information (reports, policy documents, etc., including hyperlinks to online material)

<http://www.ecodesignlink.be/en>

Ecolizer: <http://www.ecodesignlink.be/en/ecolizer-1>

For specific international examples of eco-design please refer to:

<http://www.ecodesignlink.be/en/examples-database>

3. Packaging

Description and status of the measures or programme:

In the Republic of Korea, packaging waste has been strictly regulated to minimize its generation. Since July 1993, the Government of the Republic of Korea has banned the use of polystyrene in packaging of toys and other products. This marked the start of the Government of the Republic of Korea's effort to curb packaging waste generation. Specific regulations have been issued on categories of products. For example, the ratio of total volume packaged to spare volume should not exceed 20% in most cases, and packaging should be less than two layers.

Duration:

To date, measures continue to be undertaken and continuous improvements made.

Approach:

This measure is meant to minimize packaging waste, as part of the overall goal of general waste minimization in the Republic of Korea.

Baseline for this case:

Before the first regulation was implemented in July 1993, there was no regulation on packaging waste, which resulted in a tremendous quantity of packaging waste generation.

Goals and/or targets:

No information is available at the present time.

Stakeholders involved:

In the Republic of Korea's approach to packaging waste minimization, multiple stakeholders are involved, with different responsibilities:

- a) Consumers are responsible for recognising the waste that they produce and recycle according to instructions given by local government;
- b) Producers are responsible for carrying out duties stipulated by the authorities, such as packaging products according to regulations and labelling recyclable contents;
- c) Local and central government are responsible for producing guidance documents, formulating regulations and designing implementation schemes.

Means of implementation:

According to the polluter pays principle, producers manufacturing packaging waste that levy an extra burden to process (such as plastic and metal containers that are used to contain pesticides and diapers) are charged extra fees. In 2004 alone, USD 34 million was collected from such packaging waste. Also, container deposit schemes not only incentivize consumers to voluntarily recycle packaging products but also charge extra fees to consumers not recycling. On the other hand, fees collected will be used to manage the waste minimization system itself, by way of technological innovation, technical knowledge transfer to local authorities and building waste processing infrastructure, so that the measure requires a minimum additional monetary input to sustain itself.

Challenges and incentives:

In the course of promoting such a measure at the early stage, the Government of the Republic of Korea took efforts to raise awareness among the public so that they adapted to this measure. The result of implementing such a measure over the years has been promising. Landfilled and incinerated waste has

decreased to 44%, the recycling rate increased from 15.4% to 45.2%, and the landfill rate decreased from 81.1% to 40.3%

Monitoring of implementation and performance:

As it is more difficult to monitor individual consumers' behaviour, the focus of work on consumers is an awareness-raising campaign, with occasional law enforcement on individual cases. Producers are the main focus of monitoring in packaging waste minimization in the Republic of Korea. Packaging waste producers are required to develop executive plans on extended producer responsibility and submit these to the relevant authority. If an executive plan is not submitted on time, a fine is imposed.

Evaluation:

Years of implementation has shown that packaging waste generation in the Republic of Korea has decreased drastically after implementation of the measure. It shows that such management systems can serve as a reference for other countries.

Available information (reports, policy documents, etc., including hyperlinks to online material):

http://www.me.go.kr/eng/file/readDownloadFile.do;jsessionid=Xg7NzXmxEcWGvGRrKFYVTp2ji64Ga4m5uTI5lrqBhwdfTxQvSgmhmDH1YxTN8pHA.meweb1vhost_servlet_engine1?fileId=92574&fileSeq=1

<http://www.eiatrack.org/s/664>

Jin Yaning, Zhou Bingyan, Hai Reti. Packaging Waste management in Republic of Korea [J]. Recycling Resources and Circular Economy 2008, 1(10): 37-40

4. Reuse centres

Description and status of the measures or programme:

Reuse centres are legally anchored in Belgium, inter alia, in the Flemish waste and materials legislation. Requirements and conditions on the management of a centre are legally established. The sector is partly financed through subsidies and is also explicitly part of the local (municipal) waste policy.

Duration:

Sector professionalized since the 1990s. Legally anchored since 2003.

Approach:

Mostly furniture, clothes and electrical and electronic equipment is being collected, often refurbished and put for sale. Specifically for electronic and electrical equipment, a quality label for repaired or refurbished appliances was developed.

Baseline for this case:

In the early 1990s, advanced training was offered on how to manage a reuse centre. Shortly after, the Public Waste Agency for Flanders (OVAM) requested the training centre to assess the feasibility of a reuse sector and how this sector could contribute to waste policy goals. The assessment showed good feasibility and clarified the needs towards the policy framework.

Goals and/or targets:

Three main pillars can be identified:

- a) Social economy, where the main aim is to create jobs for low-skilled and long-term unemployed persons;
- b) Reuse centres were also established with the aim to contribute to waste prevention targets by making reusable goods available and raising public awareness on this aspect of the waste hierarchy; and,
- c) To fight poverty and offer lower-price goods to people in vulnerable societal target groups.

Stakeholders involved:

Through the social goals of most reuse centres, low-skilled and long-term unemployed workers are targets. Local authorities, through their municipal waste collection centres, are expected to collaborate closely with the reuse centres and ensure access to potentially reusable goods. Specifically as regards electrical and electronic equipment, collaboration exists with Original Equipment Manufacturers (OEMs) on training, information exchange and collection of reusable equipment.

The target audience of reuse centres is the general public.

Means of implementation:

Making profits is not a goal as such for subsidized reuse centres. Sound financial management, however, is key in order to be able to keep reaching the environmental and job creation targets.

Centres that rely on heavy subsidies or mainly work with volunteers are not likely to be sustainable. By offering a broad range of products and keeping the prices low, the reuse centres succeed in achieving decent turnovers.

Total revenue in a reuse centre consists typically of approximately 40% in sales of the reused goods, approximately 14% in sales of materials to recycling and approximately 45% in subsidies, mainly for social job creation and a small part environmental (1%). The subsidy share decreases year after year.

Capacity-building, skills development and technical assistance aspects:

Employees get in-house training on specific skills, like furniture restoring or electrical and electronic equipment refurbishment. Training and information on aspects such as white goods repair and refurbishment is sometimes offered by OEMs, specifically for reuse centre employees.

Challenges and incentives:

An obvious challenge for reuse centres is maintaining sound financials. Another challenge is to keep knowledge and skills in the centres, as it is inherent in the social economy that employees are expected to work temporarily in the centre and then move into the regular economy. Often subsidy regulation also stipulates this. Intensive knowledge exchange and in-house training in the sector has provided a way to cope with this challenge.

Over the last few decades, reuse, repair and refurbishment, and the role of reuse centres has become socially accepted and established in Flanders. Compared with the approximately 5,000 to 10,000 tonnes of goods processed in the 1990s, nowadays over 65,000 tonnes are being collected, repaired, refurbished and furthered to reuse. On average, a person in Flanders reused approximately half a kilo in the 1990s. Today approximately 5 kg of goods coming through reuse centres per inhabitant are reused. With the acceptance of reuse in society, unsurprisingly more reuse occurs but remains unrecorded.

Monitoring of implementation and performance:

Before receiving a licence, a number of conditions need to be fulfilled: e.g. the area served by the centre should include at least 75,000 inhabitants, the shops should be opened at least 30 hours per week, a certain shopping surface is required per inhabitant of the served area (1m²/2000 inhabitants), at least six product categories are offered: electrical and electronic equipment, clothes, furniture, leisure goods, dishes and other goods.

OVAM provides a reporting tool in order to gather data on the reuse and preparation for reuse in the centres.

Evaluation:

Four success factors have been identified over the years:

- a) Fairly quickly social economy and reuse was linked;
- b) The incorporation of the reuse centres in the regional Flemish waste policy anchored reuse also in the municipal waste policy;
- c) A reuse association grouped almost all reuse centres and catalyzed the reuse policy in Flanders;
- d) Professionalizing the centres was key to consolidating their place in the policy landscape.

Available information (reports, policy documents, etc., including hyperlinks to online material):

http://www.ovam.be/sites/default/files/atoms/files/2015_Folder-Kringloop-engels_LR.pdf

5. Prevention of packaging in the sticker industry

Description and status of the measures or programme:

This case is a private initiative. The investment led to a reduction of 54% on the final cost of the packages, 6% of reduction on the total costs and a 12% increase in sales.

Duration:

Permanent

Approach:

In Sumare city (Sao Paulo/Brazil), there is a Brazilian branch of an international company that produces synthetic rubber based stickers. These stickers have been used in the manufacture of diapers and sanitary napkins.

To provide adequate transportation for these stickers to the diaper or sanitary napkin factories, the company used to use cardboard boxes lined with silicone. Thus the boxes could not be recycled because of the silicone lining, which made the process infeasible economically. Because of that, the stickers' buyers had an amount of 24 tonnes per year of cardboard boxes that needed to be managed afterwards.

Baseline for this case:

The company developed a new kind of packaging based on the synthetic rubber that matches the stickers. This new packaging is incorporated into the stickers when they are manufactured, removing the previous issue of disposal of the silicone lined boxes.

Stakeholders involved:

Stickers producer; the diaper and sanitary napkin industries.

Means of implementation:

The investment made by the company for implementation of the project was R\$ 95,000 (approximately USD 29,400).

Capacity-building, skills development and technical assistance aspects:

The research to implement the project was done by specialized staff.

Evaluation:

The implementation of this project has been positive. The manufacturer has had production costs reduced, the commercial customers have not had packages to manage and the total amount of waste was reduced.

Available information (reports, policy documents, etc., including hyperlinks to online material)

The document used as a base for the text is available at (in Portuguese):
<http://consumosustentavel.cetesb.sp.gov.br/wp-content/uploads/sites/39/2015/01/caso04.pdf>

6. Perchlorethylene reduction in industrial laundry**Description and status of the measures or programme:**

This case is a private initiative. By avoiding the use of 3,600 kg of perchlorethylene per month, which costs the company around R\$ 9,000 (USD 2,786) per month, a return on investment was achieved within 36 months. Searching for more efficient laundry equipment, the company found new equipment which uses a litre of perchlorethylene to wash 32 kg of clothes, resulting in an efficiency of 2.7 times that of the previous equipment.

Duration:

Permanent

Approach:

Waste prevention can be promoted by substituting part of a production process for another more efficient process. Dry processes of laundries use perchlorethylene to remove oil or grease from the textiles. However, this substance generates hazardous waste which is sent for co-processing in cement kilns.

Baseline for this case:

In Taboão da Serra city (Sao Paulo/Brazil) there is a company which consumed one litre of perchlorethylene per 12 kg of washed clothes.

Stakeholders involved:

The owner of the company.

Means of implementation:

The investment for buying the new machine was R\$ 350,000 (approximately USD 110,000).

Capacity-building, skills development and technical assistance aspects:

Technical assistance for the equipment must be available.

Evaluation:

The implementation of this project has been positive. The laundry manufacturer has seen both reduced operational costs and the amount of hazardous waste generated.

Available information (reports, policy documents, etc., including hyperlinks to online material):

The document used as a base for the text is available at (in Portuguese):

<http://consumosustentavel.cetesb.sp.gov.br/wp-content/uploads/sites/39/2015/01/caso50.pdf>

B. Waste stream approach: good practices**1. Reduction of waste sand discharged from foundries****Description and status of the measures or programme:**

The initiative here described, was taken by an industry located in São Paulo, Brazil, and was a voluntary, private enterprise. A reduction in the volume of sand discharged, besides representing a significant gain for the environment, provided an annual saving of approximately USD 300,000. This is due to a reduction in the need to purchase new sand. Moreover, the costs associated with the disposal of sand wastes within industrial landfills represented a great saving for the industry.

Nowadays, the Brazilian company in this example disposes approximately 200 to 300 tonnes per month of wastes in industrial landfills. The training of the personnel involved in the sand discharge operation led to an additional gain to the company, because the workers started to adopt a more positive and careful attitude to their activities: they felt more valued in their activity and more involved in environment protection.

Duration:

The initiative is permanent.

Approach:

The industry produces machine tools for turning and drilling operations, plastic injectors and blowers using sand to manufacture moulding material.

Baseline for this case:

The factoring of casted pieces generally uses a large amount of sand to manufacture moulding material. The use of sand, depending on the kind and the size of the piece, varies from 800 to 1000 kg of sand to each 1000 kg of produced piece. The sand is usually extracted from riverbeds or through mining and is available in varying grain sizes.

To prepare the moulds, the sand is mixed with a binder, usually bentonite, other additives and water to obtain "green sand"⁶ used in the production of the low weight and smaller sized pieces. To produce bigger pieces, the manufacture process generally uses core and moulds. These moulds are made from a mix of sand and a catalyst that increases the resistance of the pieces.

Besides the green sand, the industry previously used sand combined with phenolic resin, which made it difficult to reuse and recover and consequently generated a large amount of waste to be disposed of – approximately 1,000 tonnes of waste sand per month.

The proper disposal of such waste within industrial landfills costs approximately USD 160,000 per year.

Goals and/or targets:

The initiative aims to reduce the volume of sand discharged in addition to leading to significant benefits for the environment.

Stakeholders involved:

The stakeholders are the private sector that established the initiative and the society in general, which benefits from the enterprise.

Means of implementation:

In order to reduce the costs of the industrial process as well as to avoid the excessive generation of industrial wastes the industry took the following measures:

⁶ The name "green sand" comes from the fact that the sand mould is not "set"; it is still "green" or in an uncured state even when the metal is poured in the mould. Green sand is not green in colour, but "green" in the sense that it is used in a wet state.

- a) The replacement of phenolic resin for furan resin to produce the moulds and cores using cold curing and an organic-based catalyst. The process of preparation of the moulds, generally uses about 0.8 to 1.0% of resin in relation to the weight of the mixed sand and approximately 30 to 40% of a catalyzer substance in relation to the weight of the resin;
- b) The recovery of used sand (containing furan resin) through a mechanical process at room temperature. Currently, the industry uses 98% of reused sand and about 2% of new sand to produce moulds and cores through a furanic process. Also, the industry manufactures a large quantity of cores using the cold-curing process;
- c) The green sand recovered by a mechanical process is used to manufacture cores through a process using 85% of recovery sand and 15% of new sand. These cores are used in moulds produced by the “green sand” process.

To obtain an improvement of the abovementioned processes, the company invested an estimated USD 15,000. This amount was spent mostly on personnel training, acquisition of batches used in the mixing process of recovery sand and new sand, as well as in the fabrication of boxes to anatomic moulding used to manufacture the larger volume items of the factory.

Through the implementation of these improvements, consumption of new sand decreased from 800 kg to 200 kg to produce an amount of 1,000kg of manufactured pieces. Such developments indicate a reduction of 80% of the use of new sand and, consequently, a reduction of 80% of discharge of foundry sand.

2. Food waste

Description and status of the measures or programme:

At the domestic level, the prevention of food waste can be addressed first of all by raising public awareness of the quantities of usable food discarded, the financial losses this represents, and the environmental impact of collecting and treating this waste. Constructive information on waste prevention techniques can help households better plan their food purchases, keep food supplies fresher for longer periods, make better use of leftovers and can make a noticeable difference to household expenses. The “Love Food Hate Waste” Campaign (www.lovefoodhatewaste.com), selected as a best practice in the prevention of biodegradable waste, can be taken here as a model of the range of guidance that can be provided.

Effective awareness campaigns on the prevention of food waste will integrate waste prevention habits into individual behaviour so that actions at home, in the workplace and at leisure are consistent. Good practices are often linked to specific situations and are often abandoned when they become less convenient.

The hospitality industry faces specific waste prevention challenges. Hotel guests can generate up to a kilo of waste per person per day, making the environmental impact of tourism substantial. Food scraps make up almost 40% of total waste in the hospitality industry, often near 50% in restaurants. For example, the Porto region launched a project initiated by waste management company Lipor presenting reduced serving sizes providing for nutritional balance, in addition to economic benefits. Given its elevated waste prevention potential, the hospitality industry has been targeted separately by some waste prevention programmes, including, for example, Ireland’s Green Hospitality Award.

Changes in public behaviour, relating to the efficiency of consumption of purchased food, can be monitored using surveys of household and workplace practices and indicators demonstrating changes in habits, and these can direct further investments in specific measures based on their success in the region of implementation.

The promotion of home composting, along with the preparation of guidelines and the provision of composting bins, and separate collection programmes may help to reduce the amount of food waste – by raising citizens awareness about the amounts and types of food waste disposed.

Duration:

Many of these initiatives are temporary in nature (e.g. awareness campaigns). Others like home composting are by nature indefinite.

Approach:

Broad

Goals and/or targets:

Qualitative: food losses in terms of volumes and weight to be reduced.

Stakeholders involved:

Broad: In particular those in the hospitality industry, restaurants, catering, food production.

Available information (reports, policy documents, etc., including hyperlinks to online material):

More information on identification and analysis of existing initiatives on food waste prevention may be found in the report: Preparatory Study on Food Waste across EU-27 available at: http://ec.europa.eu/environment/eussd/pdf/bio_foodwaste_report.pdf

3. Paper waste

Description and status of the measures or programme:

Measures to reduce junk mail should include:

- a) A well-executed awareness campaign, reaching the widest possible target audience, in this case, households. Campaigns will clearly explain the amount of junk mail produced nationally and by household per year and the environmental impact of those statistics;
- b) The provision of practical, systematic information on waste prevention techniques, in this case the distribution of 'no junk mail' stickers and clear guidance on how to remove your name from mass mailing databases.

For example, the Stop Pub campaign (www.ademe.fr/stoppub) in France provides a model of activity in this area, organising information for use by non-governmental organizations, individuals and businesses and elaborating extensively on the context of the problem.

Much more effectively, 'opt-in' systems attempt to eliminate junk mail by allowing households to select and receive only mail they are interested in. Having worked well in reducing spam in email inboxes, this measure has significant potential to reduce paper waste.

Catalogues and telephone books add to the paper waste burden of households and can be avoided using measures similar to unaddressed mail, specifically through the creation of a publicly accessible database allowing households to choose which publications they receive.

There are numerous practical steps that can be taken to significantly reduce office paper waste, from double-sided paper policies, making revisions online, printing envelopes without labels, preventing paper jams, and reusing one-sided paper as notepaper. Office paper reduction campaigns can be effective in offices of any size and should be encouraged in offices of all sizes. Precise guidance on setting up an office campaign should be made widely available; an excellent example is provided by the California Integrated Waste Management Board.⁷

The structured promotion of online books, newspapers and magazines has not yet been widely adopted as a waste prevention policy, but the dematerialisation of the news media, as well as the promotion of electronic book devices, could be very helpful as part of the prevention of paper waste.

Duration:

Some of these measures themselves are not limited in time, but of course need specific action by companies or consumers (e.g. set mail preferences, reduce paper use at the office).

Approach:

Broad: paper users in companies and consumers, amongst others.

Stakeholders involved:

Broad: paper users in companies, consumers, etc.

Means of implementation:

Support from paper and printing industry necessary. Financing of campaigns and information to the public

Challenges and incentives:

As a significant problem in the United States, Catalog Choice (www.catalogchoice.org) has made it easy to set mail preferences for retail catalogues, which currently are distributed in the region of 19 billion per year and account for 53 million trees in the market in the United States alone.

Available information (reports, policy documents, etc., including hyperlinks to online material):

www.ciwm.ca.gov/BizWaste/FactSheets/Campaign.htm

4. Packaging waste

Description and status of the measures or programme:

⁷ See <http://www.calrecycle.ca.gov/>.

At the consumer level, informational strategies motivating consumers to buy products with minimised packaging content are appropriate, as well as efforts to normalise the purchase of bulk goods and expand facilities for their purchase. Waste prevention measures to address packaging waste will be organised mostly at national or supranational level. Local authorities play a role in stimulating public awareness and interest in packaging minimisation or avoidance and can support national efforts by demonstrating the demand for lower levels of packaging to manufacturers.

There are ample opportunities for tertiary packaging reduction that have not yet been widely adopted. The use or optimisation of reusable distribution materials can lead to notable waste reduction and financial savings; plastic pallets for example are much more durable than wooden models, offering ANG Newspaper Company in California a 125% return on their investment as well as the prevention of 37 tonnes of wood waste.⁸ Increasing the longevity, reducing the volume and eliminating single use shipping and handling materials can provide waste prevention opportunities in very large quantities and a shift towards this approach can be required or encouraged through incentives and subsidies. Reductions in tertiary packaging should however ensure that this does not result in a high level of damaged products.

Regulatory options for authorities include extended producer responsibility policies, as proposed recently in Canada,⁹ and taxes by volume, as introduced in 2007 on primary and secondary packaging in the Netherlands.¹⁰

Approach:

Various approaches may be relied on including those based on: type of packaging, material flow to be packaged, user of the packaging (consumer or a certain industry).

Goals and/or targets:

Enabling target setting through voluntary agreements provides a major opportunity for national authorities to further industry-wide change on packaging at all levels. Bringing manufacturers, packaging associations and major retailers together under a shared goal of packaging reduction has already had effective results in the UK.¹¹

Stakeholders involved:

Consumers, the packaging industry, industry sectors that use packaging.

Challenges and incentives:

The conception phase holds the widest possibilities for prevention, as quantities of waste can be designed out at every step of a product's life-cycle and at all three levels of the packaging that accompanies it (primary, secondary, and tertiary). The two main options for public authorities here will be requirements for eco-design criteria in the development of new products and the promotion of eco-design using online tools, training programmes and incentives created by extended producer responsibility policies. Both types of policy should encourage packaging minimisation at all levels.

It should be noted, however, that some primary packaging contributes to the reduction of food waste. For example, Morrisons supermarkets in the United Kingdom have conducted packaging research which identifies which fresh produce lasts longer when wrapped and which does not. The Public Waste Agency for Flanders, Belgium, conducted a study on the subject:
<http://ovam.be/sites/default/files/atoms/files/2015-Report-OVAM-Food-loss-and-packaging-DEF.pdf>.

Available information (reports, policy documents, etc., including hyperlinks to online material):

www.morrisons.co.uk/Corporate/Press-office/Corporate-releases/Morrisons-launch-Great-Taste-Less-Waste-campaign-to-save-families-up-to-600-per-year-

<http://ovam.be/sites/default/files/atoms/files/2015-Report-OVAM-Food-loss-and-packaging-DEF.pdf>

⁸ See <http://www.pdqplastics.com/pdf/cost-savings-case-study.pdf>.

⁹ <https://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=FB8E9973-1>.

¹⁰ http://ec.europa.eu/environment/waste/prevention/pdf/Netherlands_Factsheet.pdf.

¹¹ <http://www.wrap.org.uk/content/packaging-3>.

5. Electrical and electronic waste (E-waste)

Baseline for this case:

Some e-waste is classified as hazardous waste, notably those products containing cadmium, asbestos, PCB, lead, ozone depleting substances and cathode ray tubes.

Goals and/or targets:

Qualitative: to reduce the amount of hazardous substances in products that are used, in materials derived from recycling of e-waste and in the environment.

Quantitative: the longevity of products increases, the amount of appliances being reused, close link with eco-design (promotion of eco-design, recycled content, modularity, etc.).

Challenges and incentives:

The reuse of equipment is important, as the environmental impact of a product is minimised by using it for as long as possible. The demand for used electrical and electronic equipment is significant throughout the world. For example, the expansion of reuse networks can help meet this demand. Simplified access of reuse networks to collection sites furthermore facilitates the identification of those products that can be most easily prepared for reuse.

Extended producer responsibility (EPR) policies help internalise the cost of managing e-waste. EPR policies that link producers directly to the products they have created, rather than those imposed on the industry as a whole, can significantly reward those producers who take steps to green their supply chain and increase the durability, reparability and recyclability of their products. EPR is thus an essential incentive for eco-design, promoting waste prevention across product life-cycles.

6. Hazardous waste

Description and status of the measures or programme:

The separate collection of hazardous waste in the EU is required by the Waste Framework Directive¹² (Article 18: Ban on the mixing of hazardous waste) and contributes to reducing the quantity of hazardous material in the residual waste fraction, see further http://ec.europa.eu/environment/waste/hazardous_index.htm.

Cities like Copenhagen and Helsinki have developed specific collection infrastructure and services for household hazardous waste (e.g. stationary containers, door-to-door collection vehicles). Local authorities may also offer specific low-cost collection services to businesses qualifying as “small quantity generators”, a measure, currently in use in California, available to producers of 99 kilos or less of hazardous waste per month.

In addition to better management of existing hazardous wastes, the promotion of less or non-hazardous alternatives through informational campaigns should be part of any household hazardous waste strategy. Alameda County in California, for example, provides a range of recipes for homemade alternatives to normally toxic household products, including oven cleaners, paint strippers and pesticides, on its Stop Waste website.

Baseline for this case:

Reducing the hazardous content of products is qualitative waste prevention insofar as it decreases the total quantity of hazardous waste released. Eliminating hazardous substances from products altogether remains an overarching objective to be pursued by public authorities and by industry.

Stakeholders involved:

Effective collection or drop-off facilities are essential to the management of household and small and medium-sized enterprises (SME) hazardous waste management.

Means of implementation:

A description of the required means of implementation, including human and financial resources is provided. Aspects of transparency of the financing systems are elaborated upon.

Challenges and incentives:

Requirements or incentives for eco-redesigns of products with hazardous content are a positive initial step. The promotion of environmental management systems (EMS) that help identify inputs and generation points of hazardous waste, furthermore, can help companies measure and reduce their hazardous waste production. Training and subsidies for the establishment of targeted EMSs are two ways public authorities can encourage their incorporation into manufacturing processes.

¹² <http://ec.europa.eu/environment/waste/framework/>.

Eco-labelled products furthermore limit the toxic content of products and are easily identifiable by the consumer. Campaigns at any administrative level to increase the visibility of eco-labelled products will thus have a positive impact in reducing consumer exposure to and disposal of hazardous waste.

Available information (reports, policy documents, etc., including hyperlinks to online material):

www.stopwaste.org/home/index.asp?page=585#All-Purpose

7. Plastic waste

Description and status of the measures or programme:

This initiative has its origins in a paper entitled “The New Plastics Economy: Rethinking the future of plastics” which was presented at the World Economic Forum in 2016. It applies circular economy principles to global plastic packaging flows with the objective of transforming the plastics economy. It aims at 70% reuse, drastically reducing negative externalities such as leakage into oceans, decoupling plastics from fossil feedstocks and thus reducing the use of the global carbon budget.

“The New Plastics Economy: Rethinking the future of plastics” provides, for the first time, a vision of a global economy in which plastics never become waste, and outlines concrete steps towards achieving the systemic shift needed.

The report acknowledges that while plastics and plastic packaging are an integral part of the global economy and deliver many benefits, their value chains currently entail significant drawbacks. Assessing global plastic packaging flows comprehensively for the first time, the report finds that most plastic packaging is used only once: 95% of the value of plastic packaging material, worth USD 80-120 billion annually, is lost to the economy. Additionally, plastic packaging generates negative externalities, valued conservatively by UNEP at USD 40 billion. Given projected growth in consumption, in a business-as-usual scenario, by 2050 oceans are expected to contain more plastics than fish (by weight), and the entire plastics industry will consume 20% of total oil production, and 15% of the annual carbon budget.¹³

Achieving such systemic change will require major collaboration efforts between all stakeholders across the global plastics value chain – consumer goods companies, plastic packaging producers and plastics manufacturers, businesses involved in collection, sorting and reprocessing, cities, policymakers and NGOs. The report proposes the creation of an independent coordinating vehicle to set the direction, establish common standards and systems, overcome fragmentation, and foster innovation opportunities at scale. In line with the report’s recommendations, the Ellen MacArthur Foundation will establish an initiative to act as a cross-value-chain global dialogue mechanism and drive the shift towards a New Plastics Economy.

In May 2016, the Ellen MacArthur Foundation launched the New Plastics Economy initiative – a three-year project to mobilise the report’s recommendations together with partners from a broad group of participant companies, cities and governments across the value chain.

Baseline for this case:

1964-2014

Stakeholders involved:

The World Economic Forum, Ellen MacArthur Foundation, McKinsey Company, supported by 40 leaders from multinational companies, cities, and others.

Means of implementation:

In January 2017, a new paper “Catalyzing Action”, was presented by the New Plastics Economy initiative at the World Economic Forum. This paper identified five building blocks – dialogue, harmonisation, innovation, analysis and outreach – each of them containing catalytic actions planned for 2017. Three transition strategies have been identified to help move forward the initiative:

- a) Fundamental redesign and innovation. Without fundamental redesign and innovation, about 30% of plastic packaging will never be reused or recycled.
- b) Reuse. For at least 20% of plastic packaging, reuse provides an economically attractive opportunity.

¹³ <https://www.ellenmacarthurfoundation.org/news/new-plastics-economy-report-offers-blueprint-to-design-a-circular-future-for-plastics>.

- c) Recycling with radically improved economics and quality. With concerted efforts on design and after-use systems, recycling would be economically attractive for the remaining 50% of plastic packaging.
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