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《产业生态学报》

1997年冬, 第1卷第2期, 11-21页

题目: 绿色消费者: 关于环境标志使用和滥用的争论

作者: James Salzman

关键字: 生态标志, 环境标志, 绿色消费者, 绿色采购, 生命周期管理, 贸易政策

摘要: 第三方环境标志在全世界不断发展。然而, 环境标志正在政策层面上受到来自工业界的日益升级的挑战, 工业界认为环境标志无法鉴别环境友好产品, 而且可能被滥用, 成为贸易保护壁垒。虽然工业界对环境标志保持着很高的兴趣, 并且在某些情况下环境标志似乎对产品设计也产生一定影响, 但是环境生态标志在市场中的有效性还没有得到实践证明。至今并没有证据表明环境标志起到了贸易壁垒的作用, 在世贸组织(WTO)框架内的谈判也陷入僵局。国际标准化组织(ISO)正在制定的相关标准将可能影响环境标志在国际贸易法规中的地位。作为一个认证可持续森林采伐的非政府组织, 森林监管委员会(Forest Stewardship Council)在林产品认证领域处于领导的地位。企业对环境标志日益增长的兴趣可能源于他们对于环境标志认证可能成为非关税贸易壁垒的担忧, 甚至担心环境标志认证可能成为政府公共采购计划的基本要求。

Journal of Industrial Ecology

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Informing the Green Consumer: The Debate over the Use and Abuse of Environmental Labels

James Salzman

Keywords:

ecolabel, environmental label, green consumer, green procurement, life-cycle management, trade policy

Summary:

Third-party environmental labeling programs continue to develop around the world. They are being increasingly challenged at the policy level, however, by a well-organized industry opposition claiming that the labels do not identify environmentally superior goods and are subject to abuse as protectionist trade barriers. Ecolabels' effectiveness in the marketplace still has not been empirically proven, although industry interest remains high and in certain cases labels appear to have influenced product design. There is little empirical evidence labels have acted as trade barriers, and negotiations within the World Trade Organization are stalemated. The International Organization for Standardization is developing standards for ecolabeling programs that may influence their status under international trade law. The Forest Stewardship Council, a nongovernmental umbrella group certifying sustainably harvested timber, remains the leader in this sector of resource labels. Intense industry interest in environmental labels likely arises out of fear that labels will be used as protectionist nontariff trade barriers and, more important, that label criteria will be adopted as the basis for government public procurement programs.

《产业生态学报》

1997年冬, 第1卷第2期, 23-32页

题目: 走向新一代的环境技术: 呼唤立法改革

作者: George R. Heaton Jr., R. Darryl Banks

关键字: 环境技术, 环境政策改革, 立法改革, 技术创新, 技术政策

摘要: 环境界与工业界对于开发新一代环境技术态度十分一致, 然而相应的政策过程却很不幸地远远落后于对这个目标的要求。本文分析了美国环境政策框架造成这种状况的原因和解决方法。美国的环境法律继续充斥了对新技术的歧视, 而且管理机构的繁复进一步加剧了这个问题。在过去的几年中, 美国政府机构推出了几个重要的改革措施; 但是这些措施在现有的法律框架内只能取得有限的进展。在保持了长时间的沉默后, 是国会介入的时候了。本文提出了一个包含四项主要内容的法律改革方案: 法律要求把促进技术创新作为一个明确的环境目标; 消除目前法律系统中阻碍技术创新的结构性特征; 为标准制定和实施创造一个新的框架来促进所有企业开展环境和技术创新; 以及制定法规为环境友好技术创造“需求拉动”。

Journal of Industrial Ecology

1997, Vol. 1, Issue 2, pp. 23-32

**Toward a New Generation of Environmental Technology:
The Need for Legislative Reform**

George R. Heaton Jr. and R. Darryl Banks

Keywords:

environmental technology, environmental policy reform, regulatory reform, technological innovation, technology policy

Summary:

Given near unanimity in the environmental and industrial communities about the need for a new generation of environmental technology, the policy process unfortunately lags behind in moving toward this objective. This article examines causes and remedies for this gap in the context of American environmental policy. U.S. environmental laws continue to be pervaded by structural biases against new technology, and the complexity of their administration exacerbates the problem. Within the last few years, several important reform initiatives have arisen from inside the regulatory community; however, these can only go so far, given the current statutory framework. Congress, too long quiescent, needs to become involved. A legislative reform package is proposed consisting of four main elements: a legislative mandate that makes promotion of technological innovation an explicit environmental objective; elimination of structural features in current law that impede innovation; creation of a new framework for standard-setting and enforcement that puts every firm on a trajectory toward environmental and technological improvement; and enlisting regulation as a 'demand-pull' for environmentally superior technology.

《产业生态学报》

1997年冬, 第1卷第2期, 33-37页

题目: 电动汽车铅酸电池的清洁再循环: 对 Socolow 和 Thomas 文章的回应

作者: Lester B. Lave, Chris T. Hendrickson and Francis C. McMichael

关键字: 汽车技术, 电池, 清洁回收, 电动汽车, 铅, 含铅汽油

摘要: 我们在 Socolow 和 Thomas 在《产业生态学杂志》前一期中发表的文章的激发下写了本文。我们的研究表明由铅酸电池驱动的电动汽车 (EV) 将比使用含铅汽油的普通汽车向大气中排放更多的铅。50 万辆电动汽车的使用将导致美国铅的用量增加 20%, 同时排放到空气中的铅大概也要上升 20%。Socolow 和 Thomas 在分析中指出: (1) 在未来汽车中不使用有毒材料的决定将过度限制先进汽车的研发 (R&D), 并限制了研发活动可能产生的结果; (2) 我们没有对铅的冶炼、电池生产和回收进行全面的风险评价; (3) 为应对法律的要求, 工业界能够设计一个“清洁”铅酸电池回收系统。

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Clean Recycling of Lead-Acid Batteries for Electric Vehicles: A Reply to Socolow and Thomas

Lester B. Lave, Chris T. Hendrickson and Francis C. McMichael

Keywords:

automotive technology, batteries, clean recycling, electric vehicles, lead, leaded gasoline

Summary:

This article is stimulated by the analysis of Socolow and Thomas in the first issue of this journal. Our work showed that a lead-acid battery-powered electric vehicle (EV) would result in more lead being discharged into the environment than a comparable car burning leaded gasoline. Five hundred thousand EVs would lead to a 20% increase in lead use in the United States, and presumably a comparable 20% increase in lead discharges. The Socolow-Thomas analysis asserts: (1) choosing not to pursue technology that uses toxic materials will unduly constrain the research and development (R&D) in advanced vehicles and limit the options likely to emerge from that research; (2) we do not do a full risk assessment of the lead discharges from lead smelting battery making and recycling; and (3) in response to regulation the industry might devise a 'clean recycling' system.

《产业生态学报》

1997年冬, 第1卷第2期, 41-45页

题目: 生命周期评价的重要性: 绝非完美

作者: John R. Ehrenfeld

关键字: 环境影响评价, 产业生态学, 生命周期评价 (LCA), 政策分析, 风险评价

摘要: 生命周期评价是分析人类活动环境影响的一种新方法。象所有其他方法一样, 它在应用上具有局限性, 因此在使用时应该保持审慎。最近有一些文章强烈批评生命周期评价, 建议除了很少领域的应用外, 应采取审慎的态度。即便接受了很多上述的批评建议, 本文仍然支持生命周期评价与其他用于政策和计划领域的分析工具一样, 对于涉及产品和政策设计的过程有着重要的用途。那些反对生命周期评价的论点忽略了对于其他环境评估方法的比较。

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1997, Vol. 1, Issue 2, pp. 41-45

The Importance of LCAs--Warts and All

John R. Ehrenfeld

Keywords:

environmental impact assessment, industrial ecology, LCA, life-cycle assessment, policy analysis, risk assessment

Summary:

Life-cycle assessment (LCA) is a new method for exploring the environmental implications of human action. Like all methods, it is analytically limited and consequently it must be used with caution. Recent papers have criticized LCA and caution against its use in all but a few narrow applications. Even while accepting many of these arguments, this article argues that LCAs, like other analytic frameworks used in the policy and planning domains, have important uses in shaping the processes by which both products and policies are designed. The arguments made against the use of LCAs omit comparisons to realistic appraisals of alternative and competing methods of environmental assessment.

《产业生态学报》

1997年冬, 第1卷第2期, 51-64页

题目: 大目标: 生命周期评价中环境问题优先分组的框架方法

作者: Thomas E. Graedel

关键字: 面向环境的设计, 环境目标, 生命周期评价, 优先排序, 简化生命周期评价

摘要: 生命周期评价的目的在于开展一个用于工业产品的物质流和能量流的清单分析, 然后计算这些流动在从产品的前期制造到生命周期结束的整个生命周期的环境影响。作为一个相关技术, 简化生命周期评价 (SLCA) 试图在保持生命周期评价 (LCA) 较宽的看问题视角的同时, 旨在更加有效的进行评估。两种技术的不足之处在于, 它们所建议的改善产品环境责任的做法很少严格地和它们旨在改善的环境问题联系起来。我在文章中提出了一个通过决策过程能够将这些联系建立起来的框架, 这就是先建立维持和改进地球上的生活共识性的关键目标, 即“大目标”。大目标可以帮助识别关键环境问题, 进而决定需要考察的社会活动。然后, 我们就可以设计能够帮助实现这些大目标的相应措施。一旦这些共识形成, 我们就可以对 LCA 和 SLCA 所推荐的措施实现大目标充满信心。

Journal of Industrial Ecology

1997, Vol. 1, Issue 2, pp. 51-64

The Grand Objectives: A Framework for Prioritized Grouping of Environmental Concerns in Life-Cycle Assessment

Thomas E. Graedel

Keywords:

design for the environment, environmental objectives, LCA, life-cycle assessment, prioritization, streamlined life-cycle assessment

Summary:

The goal of life-cycle assessment (LCA) is to conduct an inventory of the flows of materials and energy attributable to an industrial product and then to calculate the impacts of those flows on the environment, over the entire product life cycle from premanufacture to end of life. A related technique, streamlined life-cycle assessment (SLCA), attempts to preserve the breadth of perspective in that approach while performing assessments more efficiently. A common failing of both techniques is that recommendations for actions to improve the environmental responsibility of products have rarely been related in an intellectually rigorous fashion to the environmental concerns they purport to ameliorate. In this article I propose that a framework for the way in which these relationships can be established is by a decision-making process that begins with the 'grand objectives,' the common consensus of the vital goals for the maintenance and improvement of life on Earth. The grand objectives lead to the identification of crucial environmental concerns, and those, in turn, to determining societal activities that need to be examined. Actions related to those activities can then be designed to contribute to the achievement of the grand objectives. If and when such a consensus is established, LCAs and SLCA can be undertaken with confidence that the actions they recommend will serve broad societal goals.

《产业生态学报》

1997年冬, 第1卷第2期, 65-89页

题目: 氯的生命周期, 第2部分: 欧洲化学工业中氯的转变过程和使用

作者: Robert U. Ayres, Leslie W. Ayres

关键字: 化工生产, 氯, 产业代谢, 物质平衡, 物质流动, 物质流分析

摘要: 本文旨在从过程数据和物质平衡的角度, 为欧洲化学工业建立一个合理的排放清单。在文章中, 我们描述了这个行业以及它的主要转化过程和排放。我们分析了从甲烷、乙烯、丙烯和苯为主的四个主要过程链, 同时还分析了五个重要的特殊过程。基于许多不同来源的数据, 我们建立了一个该行业1992年的排放状况分析。1992年, 欧洲共消耗了9,279千吨的氯盐和211千吨回收盐酸用来生产8,610千吨的纯氯, 以及278千吨的盐酸副产品。该行业的总的氯投入为8,689千吨, 其中包括12千吨来自于回收的CFCs以及来自于盐酸的79千吨氯。运往其他行业的氯和盐酸为1,367千吨, 而剩余的7,322千吨的氯则包含在产品中或者在本行业内部损耗。在行业内部损耗的氯中, 350千吨被用来生产无机化合物, 5,694千吨用来生产有机化合物, 还有1,278千吨用在其他特殊用途。我们估计产品部分占用了41.6%的总投入, 然而还有24.7%的氯成为废物。剩余的(33.7%)则以盐酸的形式在行业内循环使用。

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1997, Vol. 1, Issue 2, pp. 65-89

The Life Cycle of Chlorine, Part II: Conversion Processes and Use in the European Chemical Industry

Robert U. Ayres and Leslie W. Ayres

Keywords:

chemical manufacturing, chlorine, industrial metabolism, mass balance, materials flows, substance flow analysis

Summary:

The major purpose of this article is to construct a plausible emissions profile for the European chemical industry from process data and mass balance considerations. In it we describe this industry and its major conversion processes and emissions. Four major process chains, beginning with methane, ethylene, propylene, and benzene are analyzed, along with five important stand-alone processes. A self-consistent version of the industry is constructed for 1992, based on data from a variety of sources. In 1992 Europe consumed 9,297 metric kilotons as measured by weight of chlorine (kMT[Cl]) of salt and 211 kMT(Cl) of recycled hydrochloric acid (HCl) to produce 8610 kMT of virgin elemental chlorine, plus 278 kMT (Cl) of virgin by-product HCl. Total chlorine input to the industry was 8,689 kMT, including 12 kMT (Cl) of recycled chlorinated hydrocarbons (CHCs) and (net) 79 kMT (Cl) of HCl. Shipments of chlorine and HCl to other sectors was 1,367 kMT (Cl), while 7,322 kMT (Cl) was embodied in products or lost within the sector. Of this subtotal, 350 kMT (Cl) was used to manufacture identified inorganic chemicals, 5,694 kMT (Cl) for identified organic chemicals, and 1,278 kMT (Cl) for 'other unspecified' chemicals. We estimate that products account for 41.6% of inputs (measured at the 'fence'), while wastes account for 24.7% of total chlorine flux. The remainder (33.7%) is recycled, mainly as HCl, within the sector.

《产业生态学报》

1997年冬, 第1卷第2期, 91-110页

题目: 荷兰的氯, 第2部分: 氯的不确定性的风险管理

作者: Arnold Tukker, Rene Kleijn, Ester van der Voet, Edith R. W. Smeets

关键字: 氯, 荷兰的氯平衡, 产业代谢, 物质会计, 风险评价, 物质流分析

摘要: 近十年来, 关于工业生产中氯的争论分歧很大。环保组织确信氯的风险无法控制, 因此努力推动将氯和含氯碳氢化合物(CHC)完全淘汰。工业界则认为氯的环境风险是可以控制的, 而且由于 60%的企业在使用 CHC、CHC 生产的产品或者元素氯, 因此彻底淘汰氯既不必要也不可行。为使得这场争论更加客观, 荷兰环境部长启动了一项关于氯的战略研究。根据现有的有关氯的排放知识以及现有的评估方法, 研究表明只有为数不多的严重环境问题与氯的使用有关; 然而, 研究也发现了重要的不确定性。本文详细介绍了与氯相关的主要不确定性, 以及开展进一步研究来解决这些不确定性的潜力。对于尚存的不确定性, 本文主要依据“预防原则”评估了降低这些不确定性策略的潜在效益。

Journal of Industrial Ecology

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Chlorine in the Netherlands, Part II: Risk Management in Uncertainty for Chlorine

Arnold Tukker, Rene Kleijn, Ester van der Voet and Edith R. W. Smeets

Keywords:

chlorine, chlorine balance in the Netherlands, industrial metabolism, materials accounting, risk assesment, sustance flow analysis

Summary:

The debate over chlorine in industrialized economies has become extremely polarized in the last decade. Environmental pressure groups are striving for a virtual phaseout of chlorine and chlorinated hydrocarbons (CHCs), because they are convinced that the risks cannot be managed. Industry argues this is not necessary because environmental risks can be controlled, nor is it feasible, because at least 60% of all firms use CHCs, products made with CHCs, or elemental chlorine. In an attempt to give this discussion a more factual basis, the Dutch minister of environment launched a strategic study on chlorine (see Kleijn et al. 1997; Tukker et al. 1995). Using all available knowledge about emissions and contemporary evaluation methods, the study found only a limited number of environmental issues outstanding related to the chlorine chain; however, it also found important uncertainties. This article describes the outstanding uncertainties in more detail. It defines which uncertainties have to be regarded as chlorine-specific and the extent to which additional research can resolve them. For the remaining uncertainties the potential benefits of uncertainty reduction strategies are evaluated, relying mainly on the precautionary principle.

《产业生态学报》

1997年冬, 第1卷第2期, 111-134页

题目: 减少氯的使用: 比较化学工业中降低氯的用量与其成本之间的关系

作者: Dennis Chang, David T. Allen

关键字: 化工生产, 氯, 线性规划, 物料流, 多目标决策, 技术评价

摘要: 一个关于化学工业的物质、能量流动数学模型被用来评估该行业使用氯及其相应成本之间的利弊权衡关系。模型也可以用来评估新技术对于氯的使用的影响。虽然模型中的成本数据有很大的不确定性, 但是模型研究结果可以指导如何通过选择恰当的化工生产技术, 以经济可行的方式减少氯的使用。更重要的是, 模型显示材料流数据在评估工业体系的环境影响时能够起关键作用。

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1997, Vol. 1, Issue 2, pp. 111-134

Minimizing Chlorine Use: Assessing the Trade-offs Between Cost and Chlorine Reduction in Chemical Manufacturing

Dennis Chang and David T. Allen

Keywords:

chemical manufacturing, chlorine, linear programming, material flows, multiobjective decision making, technology assessment

Summary:

A mathematical model of the material and energy flows in the chemical manufacturing industries was used to evaluate trade-offs between cost and chlorine use in chemical manufacturing. The model was also used to assess the impact that new technologies could have on chlorine use. Although the cost data in the model were subject to considerable uncertainty, the results did provide general guidance in choosing chemical manufacturing technologies that reduce chlorine use in a cost-effective way. More significant, the modeling demonstrates that material flow data can play a critical role in assessing the environmental implications of industrial systems.

《产业生态学报》

1997年冬, 第1卷第2期, 135-148页

题目: 生命周期导向型环境管理的信息系统框架

作者: Teresa M. Shaft, Rex T. Ellington, Mark Meo, Mark P. Sharfman

关键字: 环境管理, 生命周期评价的信息系统, 生命周期管理, LCOME, 生命周期评价

摘要: 尽管大多数企业已经改进了他们的环境表现, 有很多因素促使他们在产品和生产过程的整个生命周期中采取环境管理。本文中我们讨论了被称作“生命周期导向的环境管理”(LCOEM)方法中的信息系统元素。这个方法要求公司从产品原料投入开始到最终产出物的废弃处理为止, 管理生产过程产生的效果, 也就是说从摇篮到坟墓。我们提出了一个所需信息系统的种类框架, 描述了他们在LCOEM中的使用以及他们之间的相互关系。我们最后总结了LCOEM信息系统的意义所在。

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1997, Vol. 1, Issue 2, pp. 135-148

A Framework for Information Systems in Life-Cycle-Oriented Environmental Management

Teresa M. Shaft, Rex T. Ellington, Mark Meo and Mark P. Sharfman

Keywords:

environmental management, LCA information system, life-cycle management, LCOEM, life-cycle assessment

Summary:

Although business firms have improved their environmental performance, a variety of forces are pushing businesses toward adopting environmental management throughout the entire life cycle of their products and processes. In this article we discuss the information systems elements of an environmental management approach we call 'life-cycle-oriented environmental management' (LCOEM). This approach requires the firm to manage the effects of its processes from the creation of inputs to the final disposal of outputs, that is, from cradle to grave. We present a framework of the classes of information systems needed, describe their use in an LCOEM setting and define their interrelationships. We conclude with a discussion of the implications of LCOEM information systems.