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《产业生态学报》

2006 年冬，第 10 卷第 3 期，9–24 页

题目：次国家级消费活动的环境影响：加的夫的生态足迹分析

作者：Andrea Collins, Andrew Flynn, Thomas Wiedmann, John Barrett

关键字：决策支持，环境指标，家庭消费，资源使用，可持续性，威尔士

摘要：本文利用生态足迹这一工具，以威尔士首都加的夫为研究对象，分析了次国家尺度上资源消耗的环境影响。文章首先简述了生态足迹方法，并讨论了计算国家生态足迹时可能存在的局限。为了克服上述局限，斯德哥尔摩环境研究所对生态足迹方法作了改进，并将其用于威尔士的生态足迹减量化项目。本文涉及的关于加的夫市的研究即为该项目的一部分。加的夫家庭消费的生态足迹可依据按目的划分的个人消费目录(COICOP)加以分类。文中着重阐述了生态足迹的计算结果，并指出了减少资源使用所应重点关注的几个消费领域。研究的结果已提交给加的夫市议会，并得到了相关政策部门的初步反馈。次国家级生态足迹方法作为决策支持工具，将有计划地用于与可持续发展相关的决策。文章的最后探讨了该方法的实用价值。

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The Environmental Impacts of Consumption at a Subnational Level: The Ecological Footprint of Cardiff

Andrea Collins, Andrew Flynn, Thomas Wiedmann, and John Barrett

KEYWORDS:
decision support, environmental indicator, household consumption, resource use, sustainability, Wales

SUMMARY:
This article analyzes the environmental effects of resource consumption at a subnational level (by Cardiff, the capital city of Wales), using the Ecological Footprint as a measure of impact assessment. The article begins by providing a short critique of the Footprint methodology and the limitations of methods traditionally used to calculate national Footprint accounts. We then describe the Footprint methodology developed by the Stockholm Environment Institute to overcome some of these problems and used as the basis of the Reducing Wales Ecological Footprint project, of which the Cardiff study has been a part. The main portion of this article focuses on presenting and discussing the Footprint results for Cardiff. The Ecological Footprint of household consumption in Cardiff will be presented using the international Classification of Individual Consumption According to Purpose (COICOP). Based on the results, we then identify areas of consumption that are a priority in terms of reducing resource use and discuss how these findings have been presented to the Cardiff Council. We report on the initial reactions of policy officers to the Footprint results and how the Council plans to use them to influence policy decisions relating to sustainability. Finally, in the Conclusions section, we briefly explain the value of applying the Ecological Footprint at a subnational level and its value as an evidence-based tool for sustainability decision making.

《产业生态学报》

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题目：资源使用的环境意义：德国的环境投入产出分析

作者：Stephan Moll, Jośe Acosta

关键字：环境账户，环境影响潜力，生命周期视角，国家经济帐户的环境扩展(NAMEA)，可持续的资源使用，总物流需求(TMR)

摘要：本文通过德国的案例，整合了环境投入产出分析(eIOA)与国家经济帐户的环境扩展(NAMEA)表，对 11 项环境影响变量作了研究。研究意在剖析各类最终产品生产阶段的资源使用与环境影响情况。德国约三分之二的生产过程的环境影响源于 10 条产品生产链，本文对这些产品链进行了初步的评价与排序。建筑、食品、汽车、基础金属与电力等产品类别之间相互关联——10 类产品链皆有高资源消耗、高污染(空气污染、废物等)等特点。欧盟的整合性产品政策及自然资源的可持续利用政策将有助于分析 10 条产品链的影响大小，以求减少产品全生命周期的环境影响，使环境影响与资源使用相脱钩。

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Environmental Implications of Resource Use: Environmental Input-Output Analyses for Germany

Stephan Moll and Jośe Acosta

KEYWORDS:
environmental accounts, environmental impact potentials, life-cycle perspective, national accounts matrix extended by environmental accounts (NAMEA), sustainable resource use, total material requirement (TMR)

SUMMARY:
In a German case study, environmental input-output analyses (eIOA) combined with NAMEA-type tables were conducted for eleven selected environmental pressure variables. (NAMEA is an acronym for national accounts matrix extended by environmental accounts.) The analyses were conducted to derive the production-cycle-wide resource uses and environmental impact potentials of final-demand product groups. The methodology permits identification and preliminary ranking of 10 product chains along which about two-thirds of German production-born environmental pressures arise. The most relevant product groups are construction work, food, motor vehicles, basic metals, and electricity. The ten product groups are characterized by both high resource requirements and high residual outputs (air emissions, wastes). The EU policy areas of integrated product policy and sustainable use of natural resources may address these product chains with priority in order to identify and explore the possibility of reducing the environmental impacts from products throughout their life cycles and to decouple environmental impacts from resource use.

《产业生态学报》

2006 年冬，第 10 卷第 3 期，41-56 页

题目：对比利时产品消费的自下而上的生命周期评价

作者：Bart Jansen, Karine Thollier

关键字：经济分析，污染排放，影响评价，产品的影响，整合性产品政策，市场生命周期评价(市场 LCA)

摘要：比利时产品与环境政策中应优先考虑的何种产品？本文讨论了有关的评价方法与研究结果。本项研究意在加深对比利时产品消费及产品生命周期环境影响的认识。对产品主要环境影响的初步概括将有助于吸引相关的利益群体，开展合作，深化对产品的分析，进而采取整合性产品政策以切实减少产品的环境影响。本文通过几种方法——包括自下而上法及市场 LCA 法——以比利时为研究对象，对如何评价大类产品的环境影响并制定相关政策作了分析。每大类功能产品中的代表性产品的简化生命周期评价结果乘以该产品的市场销量，即得总的环境影响值。研究发现比利时的环境影响主要源于建筑物的建设、使用以及私人交通。该评价过程在系统层面上仍存在一定的局限，方法和数据难以协调一致，为此必须进行可靠的初选。数据的选择与修正十分耗时，并带来一些其它限制。但市场 LCA 仍是方法论方面的一大贡献，有助于现行或今后的研究。为了提高这类研究的可行性与可接受性，需要统筹市场 LCA 方法及政策影响评价，建立一个所有各方协调一致的 LCA 数据库。

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Bottom-Up Life-Cycle Assessment of Product Consumption in Belgium

Bart Jansen and Karine Thollier

KEYWORDS:
economic analysis, emissions, impact assessment, impacts of products, integrated product policy, market life-cycle assessment (LCA)

SUMMARY:
The presented study shows the results and methodology applied to the study on the identification of priority product categories for the Belgian product and environmental policy. The main goal of the study was to gather insight into the consumption of products in Belgium and their related lifecycle environmental impacts. The conclusions of this project on the product categories with major environmental contributions would be used to start up working groups involving stakeholders and initiate detailed product studies on the impact reduction potential that could be achieved by means of implementing product policy measures. Several ways of assessing product category environmental impacts have been developed and the effects of policy measures; 'bottom-up' or ' market-life-cycle assessment' is one of these, and we tried this approach for the situation in Belgium. Simplified life-cycle assessment (LCA) studies were conducted for representative average products within each function-based product category and the results were multiplied with market statistics. Using this approach, we found that building construction, building occupancy and personal transport are among the major categories in Belgium. The major drawbacks of this approach are the system level limitations and the existence of a broad spectrum of nonharmonized methods and datasets from which a sound preliminary selection had to be made. Consequently, the retrieval and selection of data was very time consuming and due to this we had to build in some major limitations. Nevertheless, the study has contributed to the development of a methodology for market-LCA and elements that can be picked up in currently ongoing and future work. The study concludes that to improve the feasibility and acceptance of this type of study there is a need for the development of a harmonized methodology on market-LCA, policy relevant impact indicators as well as a harmonized and stakeholder agreed upon LCA database.

《产业生态学报》
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题目：瑞典将环境账户用于整合性产品政策的经验

作者：Viveka Palm, Anders Wadeskog, Göran Finnveden

关键字：投入产出分析(IOA)，产品组，私人消费，环境影响，生产者延伸责任制(EPR)，瑞典

摘要：本文旨在评价并排序瑞典不同类型产品消费所导致的环境压力。基于经济与环境的统计信息，研究采用投入产出法分析了 50 组产品的 1998 年的环境影响。这一分析对数据系统作了更新和与国际标准相一致的规范化处理，研究了环境目标与整合性产品政策(IPP)目标之间的联系，将有助于 IPP 的推广。本文是对提交给瑞典生产者责任委员会与瑞典环保局的两份报告的综合。研究指出消费的多少是决定产品环境压力与环境影响强度的重要因素。最重要的私人消费品包括石化产品、电力、楼宇、食品饮料及交通工具。本文还讨论了 IPP 评价指标的问题。

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Swedish Experience Using Environmental Accounts Data for Integrated Product Policy Issues

Viveka Palm, Anders Wadeskog, and Göran Finnveden

KEYWORDS:
input-output analysis (IOA), product groups, private consumption, environmental impact, extended producer responsibility (EPR), Sweden

SUMMARY:
The aim of this article is to evaluate how much environmental pressure different product groups consumed in Sweden are causing, in order to rank them by environmental pressure. This is done using information from economic and environmental statistics. An analysis for the year 1998 is performed for about 50 product groups using input-output analysis. This type of analysis has some major advantages for integrated product policy (IPP) purposes: the underlying data are regularly updated, the data systems are being harmonized by international standards, and the connection between environmental goals and IPP goals can be investigated. This article summarizes two Swedish reports, one for the Producer Responsibility Committee and one for the Swedish Environmental Protection Agency. The results show that the volume of consumption is an important factor in environmental pressure from products as well as impact intensities. The most important product categories for private consumption are petroleum products, electricity, construction, and food and beverages, as well as transport. Possibilities of building indicators for IPP are also discussed.

《产业生态学报》
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题目：丹麦产品导向型环境政策的优先级的确定

作者：Bo P. Weidema, Sangwon Suh, Philippa Notten

关键字：消费，丹麦，影响评价，投入产出分析(IOA)，确定优先序列，产品政策

摘要：本文应用扩展投入产出分析工具分析了丹麦的产品导向型环境政策。根据对系统的定义，环境影响可能来自供应、消费及过程三个方面。作者列举了 138 类工业产品及 98 类最终消费品中 10 类最重要商品的环境影响总量及单位强度，涵盖了所有三方面的环境影响以及所有可能导致显著环境影响(如全球变暖、臭氧层空洞、酸雨、富营养化、光化学烟雾、生态毒性、生理毒性及自然占用等)的重要物料。产品三方面的环境影响有何不同？文章对此作了详述并讨论了相关政策的问题。前 10 类产品的环境影响可占到丹麦生产与消费总体环境影响的 45%，十分惊人。因此，产品导向型环境政策可将重点放到有限的几类产品上。相较自产自用品，丹麦进口或出口产品的环境影响往往更大，其中又以肉制品出口及水运为最。为此，需要制定面向海外生产商与海外市场的特定的产品政策。公共消费，因为涉及大量的劳动力投入，其环境影响强度往往比私人消费小很多。这项研究在数据和方法上作了很大改进，其结果较其它相关研究更为详尽也更为精确。虽然方法论问题不是本文的重点，但作为背景资料，文章对此作了简述。

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Setting Priorities within Product-Oriented Environmental Policy: The Danish Perspectives

Bo P. Weidema, Sangwon Suh, and Philippa Notten

KEYWORDS:
consumption, Denmark, impact assessment, input-output analysis (IOA), prioritization, product policy

SUMMARY:
To focus Danish product-oriented environmental policy, a study applying extended input-output analysis has been performed, identifying the most important product groups from an environmental perspective. The environmental impacts are analyzed from three different perspectives—the supply perspective, the consumption perspective, and the process perspective—differing primarily in their system delimitation. The top ten environmentally most important product groups (out of 138 industry products and 98 final consumption groups) are listed for each of the three perspectives, using both total environmental impact and environmental impact intensity as ranking principles. The study covers all substances that contribute significantly to the environmental impact categories of global warming, ozone depletion, acidification, nutrient enrichment, photochemical ozone formation, ecotoxicity, human toxicity, and nature occupation. The differences in results between the three perspectives are elaborated and their policy relevance discussed. The top ten product groups account for a surprisingly large share of the total environmental impact of Danish production and consumption (up to 45%, depending upon the perspective). This implies that product-oriented environmental policy may achieve large improvements by focusing on a rather small number of product groups. Both imported products and products produced for export in general cause more environmental impact than products produced in Denmark for the Danish market. Especially noticeable are the export of meat and ship transport. This leads to the recommendation to include specific policy measures targeting both foreign producers and foreign markets. Public consumption is found to have a much smaller environmental impact intensity than private consumption, which is explained by its relatively large input of labor. The results confirm results of other similar studies, but are more detailed and have lower uncertainty, due to a number of improvements in data and methodology. A short presentation of the methodology is provided as background information, although this is not the main focus of this paper.

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题目：进口对家庭环境影响的重要性之辨析

作者：Glen P. Peters, Edgar G. Hertwich

关键字：二氧化碳(CO_2)，投入产出分析，氮氧化物(NO_x)，二氧化硫(SO_2)，可持续消费，结构路径分析

摘要：鼓励可持续的消费模式有望减少消费过程的环境影响。消费者的环境影响可能是直接的(如个人汽车的油耗)也可能是间接的(如来自消费品生产过程的影响)。随着国际贸易与日俱增，同一产品的环境污染可能产生于不同的区域，间接的环境影响也就越来越难以衡量。很多早先的研究假设出口产品与本国产品所用的技术是一样的。对一个技术及能量来源多样化的国家，这一假设可能引起较大的误差。本文以挪威的家庭为研究对象，考虑了技术的差异问题。大量挪威家庭消费所引起的污染与产品的进口，尤其是来自发展中国家的产品进口有关。在前期研究的基础上，我们发现多数家庭环境影响是交通与食品消费所导致的。对很多产品(特别是食品、商业服务、服装、化学品、家具、汽车、农产品、纺织品及大多数制造业商品)而言，污染主要产生于该产品的出口国。

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The Importance of Imports for Household Environmental Impacts

Glen P. Peters and Edgar G. Hertwich

KEYWORDS:
carbon dioxide (CO_2), input-output analysis, nitrogen oxides (NO_x), sulfur dioxide (SO_2), sustainable consumption, structural path analysis

SUMMARY:
A promising way to reduce environmental impacts of consumer expenditure is through the encouragement of more sustainable consumption patterns. Consumers cause environmental impacts both directly, such as by fuel use in personal cars, and indirectly, by paying for the production of consumables. With increased international trade, the indirect environmental impacts are difficult to determine because a portion of the emissions occurs in different geographical regions. Many previous studies have unrealistically assumed that imports are produced using domestic production technology. For countries with diverging technology and energy mixes the likely errors are significant. This study applies a methodology that explicitly includes technology differences to the case of Norwegian households. It is found that a significant portion of pollution is embodied in Norwegian household imports. Further, a disproportionately large amount of pollution is embodied in imports from developing countries. Overall, as in previous studies, we find that mobility and food are most important in terms of household environmental impacts. By analyzing the imports in more detail we find that for some sectors the majority of emissions occur in foreign regions; in particular, this is true for food, business services, clothing, chemicals, furniture, cars, agriculture, textiles, and most manufactured products.

《产业生态学报》
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题目：与狼共舞：环境产品政策战略的革新

作者：Jan L. de Vries, Harry R. M. te Riele

关键字：去耦合，生态设计，混合分析，革新，反弹效应，可持续转化

摘要：流行于 20 世纪 90 年代的对多种特定产品进行干预的环境政策已经走到了尽头。当今产品环境政策关注的对象为宏观的产品组。首先对产品进行有针对性的选择，对研究目标框架做出合理的界定，从而减少总的环境影响。消费者单位消费的生命周期环境影响是评价产品环境政策的重要依据。该方法有机整合了减少宏观环境影响与实现微观产品创新这两大目标，对经济高速增长、消费模式发生变化及存在反弹效应等复杂情况都能作出有效地反应。以荷兰经济为例，从现在到 2040 年， 应重点降低定义为 “狼群”的 44 类产品组的单位消费的生命周期环境影响。作者提出了的具体改进幅度。本文最终探讨了如何通过政策调控实现“狼群”产品组的可持续转化。处理这一复杂变化过程，关键要有广泛联系的视野、切实可行的实验方案、从微观到宏观的积极互动乃至一定的紧迫感。

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Playing with Hyenas: Renovating Environmental Product Policy Strategy

Jan L. de Vries and Harry R. M. te Riele

KEYWORDS:
decoupling, eco-design, hybrid analysis, innovation, rebound effect, sustainable transition

SUMMARY:
The 1990s policy trend of intervening at the specification level over a broad range of products has ended. Today’s environmental product policies focus, rather, on a few arbitrary product groups. Selectiveness should serve absolute environmental impact reduction, which asks for a rational product-selection and target framework. The authors propose “life-cycle impact per consumer expenditure” as a key criterion. This criterion helps to connect macro environmental impact reduction aims with product innovation targets, even under continuous economic growth, consumption pattern shifts, and rebound threats. The authors analyze the Dutch economy as an exercise. This results in 44 product groups, labeled “Hyenas” by the authors, that need to improve their ratio score drastically between now and 2040. Some magnitudes of desired change are given. Finally, intervention processes at the Hyena group level along the lines of sustainable transition management are proposed. Joint visioning, experimental portfolios, interaction between micro, meso, and macro change levels, and gradual pressure building are crucial elements in this concept of complex change management.

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题目：欧盟消费过程的环境影响：带有详尽环境扩展的高精度投入产出表

作者：Gjalt Huppes, Arjan de Koning, Sangwon Suh, Reinout Heijungs, Lauran van Oers, Per Nielsen, Jeroen B. Guinée

关键字：综合环境数据集(CEDA)，混合生命周期评价，投入产出分析，整合性产品政策，生命周期评价，包括环境账户的国家账户矩阵(NAMEAs)

摘要：现有的产品生命周期评价相互之间可比性差，对消费过程的涵盖也不完全，对深入认识产品的环境影响，制定合理的产品政策是不利的。以欧盟为例，目前尚未作出包含整个消费生命周期的带环境扩展的区域级投入产出分析(EEIOA)。国家级的分析也存在行业精度差及环境扩展有限的问题。本文分析了欧盟家庭消费的环境影响，填补了详细 LCA 与低精度 EEIOA 之间的空白。除生产活动之外，本项研究还包括了造成直接环境污染的很多消费活动，如驾车、烹饪、采暖、废弃消费品管理等。研究的数据来自欧洲国家的一些零散、粗糙的经济及环境统计，技术方面的数据则主要取自美国。

部分产品和服务单位欧元产出的环境影响显著，同时销量也很大。肉制品、奶制品及家庭供暖、小汽车等即属此类，它们导致的总的环境影响极大。还有一些其它产品和服务，如酒吧、饭店、服装、民用住宅及电信等，单位欧元的环境影响不大，但总的消费量巨大，最终的环境影响也十分可观。由于现时数据的缺乏，为了使模型实用化，还必须作出一些大胆的假设。总之，欧洲总体的数据亟待改进，国家账户所包含产业部门的详尽程度至少应向美国与日本看齐。

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Environmental Impacts of Consumption in the European Union: High-Resolution Input-Output Tables with Detailed Environmental Extensions

Gjalt Huppes, Arjan de Koning, Sangwon Suh, Reinout Heijungs, Lauran van Oers, Per Nielsen, and Jeroen B. Guinée

KEYWORDS:
comprehensive environmental data archive (CEDA), hybrid life-cycle assessment, input-output analysis, integrated product policy, life-cycle assessment, National Accounting Matrix including Environmental Accounts (NAMEAs)

SUMMARY:
For developing product policy, insight into the environmental effects of products is required. But available life-cycle assessment studies (LCAs) are hardly comparable between different products and do not cover total consumption. Input-output analysis with environmental extensions (EEIOA) of full consumption is not available for the European Union. Available country studies have a low sector resolution and a limited number of environmental extensions. This study fills the gap between detailed LCA and low-resolution EEIOA, specifying the environmental effects of household consumption in the European Union, discerning nearly 500 sectors, while specifying a large number of environmental extensions. Added to the production sectors are a number of consumption activities with direct emissions, such as automobile driving, cooking and heating, and a number of postconsumer waste management sectors. The data for Europe have been constructed by using the sparse available and coarse economic and environmental data on European countries and adding technological detail mainly based on data from the United States.

A small number of products score high on environmental impact per Euro and also have a substantial share of overall consumer expenditure. Several meat and dairy products, household heating, and car driving thus have a large share of the total environmental impact. Due to their sales volume, however, products with a medium or low environmental score per Euro may also have a substantial impact. This is the case with bars and restaurants, clothing, residential construction, and even a service such as telecommunications. The limitations in real European data made heroic assumptions necessary for making the model operational. One conclusion, therefore, is that provision of data in Europe urgently needs to be improved, at least to the level of sector detail currently available for the United States and Japan.

《产业生态学报》
2006 年冬，第 10 卷第 3 期，147-158 页

题目：整合性产品政策的信息支持工具：数据与计算方面的要求

作者：Reinout Heijungs, Arjan de Koning, Sangwon Suh, Gjalt Huppes

关键字：环境政策，生命周期分析(LCA)，投入产出分析(IOA)，混合分析，计算结构，决策支持

摘要：根据欧盟的经验，整合性产品政策有赖于对消费品环境影响数据的切实掌握。为此，需要开发一套整合了生命周期评价与投入产出分析的混合分析工具。这套混合分析工具应达到一定的要求，包括数据和计算结构等。本文讨论了数据结构的一些要点，并给出了几项计算结构的操作范式。

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Toward an Information Tool for Integrated Product Policy: Requirements for Data and Computation

Reinout Heijungs, Arjan de Koning, Sangwon Suh, and Gjalt Huppes

KEYWORDS:
environmental policy, life-cycle assessment (LCA), input-output analysis (IOA), hybrid analysis, computational structure, decision support

SUMMARY:
Integrated product policy, according to the European Union, requires reliable data on the impact of consumer products along their life cycles. We argue that this necessarily requires the development of an information tool for hybrid analysis, combining aspects of life-cycle assessment and input-output analysis. A number of requirements in the development of such a hybrid information tool are identified, mainly concerning data and computational structure. For the former, some important points of attention are discussed, whereas for the latter, operational formulas are developed.

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题目：产品的环境影响：研究综述

作者：Arnold Tukker, Bart Jansen

关键字：消费，环境评价，环境政策，整合性产品政策(IPP)，投入产出分析，生命周期分析(LCA)

摘要：经济活动的环境影响最终是由消费驱动的，为了满足人们的消费需求，才导致了产品及服务的生产、使用与废物管理阶段的种种环境影响。致力于解决产品生命周期环境影响的整合性产品政策(IPP)是新一代的有所创新的环境政策。这一政策重在认识生命周期影响最为显著的产品及最终的消费过程。基于欧盟产品环境影响(EIPRO)课题所包含的一般性研究，本文对 11 项分析消费行为相对重要性以及生命周期环境影响的研究作了综述。与过去 25 年来多数相关研究综述不同，本文所涵盖的环境影响十分广泛，不单纯局限于能耗及二氧化碳(CO_2)等方面。研究所用的方法各具特色，有的是既有的 LCA 数据向消费过程的延伸，还有的则基于带有环境扩展的投入产出(EEIO)分析表。不同研究所涉及的地理区域、需求分类、数据清单及影响评价方法大为不同。但它们揭示的关键的消费行为则是有限的几类。对目前欧盟 25 个国家 55%的最终消费的调查显示，主要三类消费为住房、交通和食品，它们所引起的环境影响占总环境影响的 70%。环境影响显著的交通方式为小汽车及飞机；环境影响较大的食品为肉制品及奶制品；居住方面的环境影响则主要取决于房屋结构、采暖及供电方式。服饰、通讯、医疗、教育等方面的影响则相对较低。因为本文纵览了不同研究项目与方法，得出的结论应是十分可靠的。此外，本文也谈到了方法的协调与改进问题：包括对进口货品进行建模，模型中考虑资本商品，区分家庭消费与政府消费等。

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Environmental Impacts of Products: A Detailed Review of Studies

Arnold Tukker and Bart Jansen

KEYWORDS:
consumption, environmental assessment, environmental policy, integrated product policy (IPP), input-output analysis, life-cycle assessment (LCA)

SUMMARY:
Environmental effects of economic activities are ultimately driven by consumption, via impacts of the production, use, and waste management phases of products and services ultimately consumed. Integrated product policy (IPP) addressing the life-cycle impacts of products forms an innovative new generation of environmental policy. Yet this policy requires insight into the final consumption expenditures and related products that have the greatest life-cycle environmental impacts. This review article brings together the conclusions of 11 studies that analyze the life-cycle impacts of total societal consumption and the relative importance of different final consumption categories. This review addresses in general studies that were included in the project Environmental Impacts of Products (EIPRO) of the European Union (EU), which formed the basis of this special issue. Unlike most studies done in the past 25 years on similar topics, the studies reviewed here covered a broad set of environmental impacts beyond just energy use or carbon dioxide (CO_2) emissions. The studies differed greatly in basic approach (extrapolating LCA data to impacts of consumption categories versus approaches based on environmentally extended input-output (EEIO) tables), geographical region, disaggregation of final demand, data inventory used, and method of impact assessment. Nevertheless, across all studies a limited number of priorities emerged. The three main priorities, housing, transport, and food, are responsible for 70% of the environmental impacts in most categories, although covering only 55% of the final expenditure in the 25 countries that currently make up the EU. At a more detailed level, priorities are car and most probably air travel within transport, meat and dairy within food, and building structures, heating, and (electrical) energy-using products within housing. Expenditures on clothing, communication, health care, and education are considerably less important. Given the very different approaches followed in each of the sources reviewed, this result hence must be regarded as extremely robust. Recommendations are given to harmonize and improve the methodological approaches of such analyses, for instance, with regard to modeling of imports, inclusion of capital goods, and making an explicit distinction between household and government expenditure.

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题目：产品的环境影响：政策相关信息与数据方面所面临的挑战

作者：Arnold Tukker, Peter Eder, Sangwon Suh

关键字：消费，去耦合，带有环境扩展的投入产出(EEIO)表，产品的环境影响，整合性产品政策(IPP)

摘要：实现物流与产品的可持续管理需要对各种复杂的社会、生态和经济因素做出不断的评价；本期专刊所包含的研究都说明交通(汽车及航空)、饮食(如肉、禽、鱼、奶)、居家能耗(包括取暖、制冷、家电及照明)等有限的几类消费是造成大量环境影响的主因。不同产品组的单位欧元环境影响差异不大，因此提倡使用一些低影响的产品组就不如切实减少上述各类主要产品的生命周期环境影响。此外，提高物质产品消费的效率在改善生活质量方面同样大有可为。带有环境扩展的投入产出(EEIO)表是确定产品环境影响大小，进行方案评价、情景分析以及监控的有效的信息支持工具。欧洲统计局(Eurostat)记录了欧盟 25 国的投入产出表，将之与其它官方(污染与资源使用的)统计信息有机结合，建立起欧盟范围的包括 60 个行业部门的 EEIO 表，具有重大的意义和价值。通过进一步的努力，包括(1)强化欧盟 25 国的综合环境数据集(CEDA)，(2)在现有数据收集体系下建立全欧洲的真正投入产出详表，(3)创建新的更专业的数据收集与分类体系，涵盖 150 个或更多行业部门的 EEIO 表也有望建成。问题的关键在于统一产业部门、消费及产品的分类体系，使得数据集能有效地与投入产出表相衔接。

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Environmental Impacts of Products: Policy Relevant Information and Data Challenges

Arnold Tukker, Peter Eder, and Sangwon Suh

KEYWORDS:
consumption, decoupling, environmentally extended input output (EEIO) tables, impacts of product, integrated product policy (IPP)

SUMMARY:
The work presented in this special issue shows that the same limited number of consumption categories are consistently revealed to be responsible for the largest share of environmental impact: mobility (automobile and air transport), food (meat, poultry, fish, and dairy followed by plant-based food), and energy use in the house (heating, cooling, electrical appliances, and lighting). It appears that differences in impact per euro between the product groupings are relatively limited, so it is essential to reduce the life-cycle impacts of products as such, rather than to shift expenditures to less impact-intensive product groupings. Furthermore, the effectiveness of expenditure on material products to improve quality of life leaves much room for improvement. Environmentally extended input-output (EEIO) tables probably form, in this field, the most appropriate information support tool for priority setting, prospective assessment of options, scenario analysis, and monitoring. A clear benefit would result from integrating the input–output (IO) tables of the 25 individual countries that make up the European Union (EU) report to Eurostat, with other officially available information on emissions and resources use, into a 60-sector EEIO table for the EU. This, obviously, would be the first step toward more detailed tables. Three strategies are suggested to realize the additional, desirable detail of 150 sectors or more, each achievable at an increasing time horizon and with increasing effort: (1) developing further the current CEDA EU25 table; (2) building a truly European detailed input–output table accepting the restrictions of existing data gathering procedures; and (3) as (2), but developing new, dedicated data gathering and classification procedures. In all cases, a key issue is harmonizing classification systems for industry sectors, consumer expenditure categories, and product classifications (as in import/export statistics) in such a way that data sets may adequately be linked to input–output tables.