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Dialogue on ecosystem services, payments and outcome based approaches

Background Brief

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BALTIC COMPASS

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INTRODUCTION

Baltic COMPASS (Comprehensive Policy Actions and Investments in Sustainable Solutions in Agriculture in the Baltic Sea Region), a project to promote sustainable agriculture in the Baltic Sea Region, was funded by the EU Baltic Sea Region Programme from December 2009 to December 2012.

As part of the project's Policy Adaptation and Governance Work Package, we organised a dialogue on payments for ecosystem services (PES) and outcome-based approaches. The underlying idea is that the agricultural sector does more than produce food – it often provides a host of ecosystem goods and services.

The dialogue included assessments of the effectiveness of different policy instruments to support agricultural practices that also generate ecosystem services. The specific aim was to develop a methodology for an outcome-based approach to assess ecosystem service provision as a pre-requisite for the introduction of schemes providing payments for ecosystem services. The Baltic Environment Forum (BEF), in collaboration with Dr Gerald Schwarz, also conducted case studies in Lithuania and Latvia.

This paper provides background information about ecosystem services, PES and outcome-based approaches. We hope that the dialogue will assist in sharing lessons learned between countries and across sectors and generate new insights in the context of different agricultural practices.

Background

Agricultural production is often associated with significant negative environmental impacts (e.g., greenhouse gas emissions and soil, air and water pollution). On the other hand, agriculture can also provide important ecosystem services and help maintain species-rich habitats and the regulation of water flows. In this regard, different farming practices have different impacts and different benefits. The on-going revision of the EU's Common Agricultural Policy for 2014 and beyond, which has set "greening" the CAP as one of its goals, has increased recognition of the importance of ecosystem services provided by agriculture.

A recent Baltic COMPASS report highlighted the diversity of farming systems in the BSR as an opportunity to recognise and value the environmental public goods under different modes of agricultural production (Powell et al. 2012). When viewed at a European scale, the production systems in the BSR are less intensive and use fewer external inputs than the European average. In the process of "greening" the CAP, PES offer a way to recognise the value of farms that generate a considerable amount of ecosystem services. Seeing this as a potential "win-win" solution, Baltic COMPASS has coordinated assessments and facilitated discussions among key stakeholders.

Ecosystem services

The Millennium Ecosystem Assessment was initiated in 2001 under the auspices of the United Nations, with the mandate to "assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being".[1] Human well-being is linked to ecosystems through our reliance on the benefits we obtain from them, known as "ecosystem services". Ecosystem services are classified under four categories: a) *provisioning services*, such as providing food, water, timber, and fibre; b)

[1] See http://www.unep.org/maweb/en/About.aspx.

regulating services that affect climate, floods, disease, wastes, and water quality; c) *cultural services* that provide recreational, aesthetic, and spiritual benefits; and d) *supporting services* such as soil formation, photosynthesis, and nutrient cycling(Hassan et al. 2005).

Since the publication of the Millennium Ecosystem Assessment, the use of the concept of ecosystem services concept has increased dramatically. In practice, one of the key challenges in promoting ecosystem services in agriculture is to ensure an appropriate balance between the supply of provisioning services such as food, fibre and fuel, and non-provisioning ecosystem services such as regulating, cultural and supporting services. Given that there are no markets for non-provisioning services, they are often undersupplied.

PAYMENTS FOR ECOSYSTEM SERVICES

Payments for ecosystem services (PES) – also known as payments for environmental services – have attracted increasing interest as a mechanism to translate external, non-market values of the environment into real financial incentives for local actors (e.g. land managers) to provide such services (Engel et al. 2008). PES essentially compensate land managers and others for undertaking actions that increase the quantity and quality of desired ecosystem services, which benefit specific or general users, often remotely. The most popular definition of PES originates from Wunder (2005), who describes PES as voluntary transactions in terms of direct payments from the beneficiaries to the providers of enhanced ecosystem services, conditional on the successful provision of the services.

A number of studies have attempted to provide an overview of existing PES. For example, OECD (2010) provides a comprehensive literature review analysing environmental efficiency and cost-effectiveness of 41 case studies of PES across the globe. Most of the reviewed case studies from developing countries focus on hydrological services and forest conservation, while case studies from developed countries cover environmental objectives such as biodiversity conservation, water quality, landscape quality and, more generically, agri-environmental quality.

DEFRA (2010) classifies PES according to the policy context, and differentiates agri-environmental payments and payments for watershed protection, carbon sequestration, habitat/wildlife protection and bio-prospecting. It is important to emphasise, however, that the development and implementation of PES is a dynamic field, and new examples emerge every year.

PES can vary according to the number of ecosystem services targeted (single vs. multiple), financing arrangements (government vs. private) and the implemented payment approach. Payment approaches can be classified into two main categories (DEFRA, (DEFRA 2010; OECD 2010; Zabel and Roe 2009):

- *Outcome-based* payments (also called payments by results or performance payments), based on actual ecosystem or environmental services delivered;
- *Action-based* payments, based on the adoption of particular land uses or land management practices that are expected to deliver additional ecosystem services and benefits.

Outcome-based vs. action-based PES

Measured in terms of the uptake by farmers or area coverage, the action-based approach has been successful. As of 2009, 22% of the utilised agricultural area of the EU-27 was under an agri-environment agreement – though the distribution is uneven; in Lithuania, 6.8% of the

UAA was under an agri-environment agreement (European Network for Rural Development 2011). However, while uptake has been used as an indicator of effectiveness in regular EU reviews for almost a decade now (Herzog et al. 2005), critics have argued that agri-environmental measures are not meeting the full potential for PES to deliver environmental benefits. This suggests that there is a need for further improvements of the design, targeting and implementation of the payments, as well as for greater provision of advice to farmers and investment in improving institutional capacity.

Strictly speaking, only outcome-based payment approaches fulfil the conditionality criteria of the PES definition. Past experiences have shown that paying for the adoption of certain land management practices does not necessarily deliver the desired environmental benefits and ecosystem services. In this context, Butler et al. (2010) observed that while the weight of management options for Entry Level Stewardship in the UK is towards resource delivery in ecologically vital cropped areas, most land owners, given the choice, select options involving management of farm margins and hedgerows. As a result, the authors conclude, farmland bird species are likely to continue to decline. If this scheme were outcome-based, this management choice would not result in payment.

The success or failure of outcome-based approaches will be judged by their ability to deliver better ecosystem services than action-based approaches. Burton and Schwarz (2013) synthesise the current scientific discussion of outcome-based and action-based approaches and highlight a number of reasons why such environmental improvements can be achieved with outcome-based approaches. First, where farmers are permitted to innovate in environmental provision, they are able to incorporate existing knowledge that is more context specific, heterogeneous and subtle (Swagemakers et al. 2009), which theoretically should improve the efficiency of production (Klimek et al. 2008; Zabel and Roe 2009). Although farmers' understanding of biodiversity production will initially be limited, over time they should be able to utilise the same skills developed for conventional production in the pursuit of environmental production (Burton and Schwarz 2013). To support this process, trainings courses can be offered to farmers and trials can be conducted to test prototype schemes.

Second, removing managerial restrictions allows farmers more flexibility in the management of the land, can improve the environmental targeting, and is likely to increase the uptake of any scheme (e.g., Wittig et al. 2006; Klimek et al. 2008). While it is difficult to attribute causality, the initial uptake rates of outcome-based approaches have been very positive, suggesting, at the very least, that the schemes are as attractive as action-based approaches despite the increased risks (e.g., Matzdorf and Lorenz 2010).

Third, linking payments to specific environmental goals means farmers see environmental objectives as environmental goods – so-called "non-commodity outputs" (OECD 2001). Outcome-based payments incentivise the use of land for production that will produce the best environmental results (Matzdorf and Lorenz 2010), negating the "adverse selection" effect (Quillérou and Fraser 2010). This prompts farmers to develop the type of whole-farm approach to environmental provision that researchers have suggested is likely to deliver improved environmental benefits (Mander et al. 1999; Butler et al. 2007).

A critical element in outcome-based PES is the development of approaches measuring the performance (i.e. actual ecosystem benefits) achieved by the land managers. Measurement approaches include complex conservation value indices in the Tasmanian Conservation Fund; biodiversity benefits index in the Victorian Bush Tender; the biodiversity complementarity score and environmental benefit index in the Auction for Landscape Recovery in Australia; and the environmental service index in the Regional Integrated Silvopastoral Ecosystem

Management Project in Nicaragua, as well as simple payments per carnivore offspring in the Sami Villages Schemes (Zabel and Roe 2009; OECD 2010).

As a general rule, indicators should be quantifiable, transparent, and easily understood by practitioners (Zabel and Roe 2009; Burton and Schwarz 2013). The use of several indicators for different habitats (e.g. the Biodiversity Significance Score and Habitat Services Score in the Victorian Bush Tender or the biodiversity complementarity score and environmental benefit index in the Auction for Landscape Recovery) may help to ensure that the management of a site is appropriately tailored to local conditions and integrated in a better targeting of multiple environmental objectives and ecosystem services. However, a balance needs to be struck between allowing sufficient flexibility in the range of indicators used and ensuring that they are specific enough to assess that objectives are being achieved by the land managers.

Outcome-based PES in Europe

The potential of outcome-based PES is also generating increased interest in Europe. Within Germany where experience with outcome-based approaches has been generated for almost a decade, the focus of outcome-based approaches is on the preservation of species-rich meadows with schemes operating in Baden-Württemberg (Oppermann and Briemle 2002) and Lower Saxony (Niedersächsische Ministerium für Ernährung, Landwirtschaft, Verbraucherschutz und Landesentwicklung 2012; Zabel and Roe 2009). Similar payments are also implemented in the Federal States of Brandenburg, Thuringia and Rhineland-Palatinate(Oppermann 2009). Early examples were implemented in the UK (conservation of hay meadow and pasture plants species in the Peak District National Park (Buckingham et al. 1998)) and Switzerland (support for ecological quality of meadows and establishing ecologically valuable networks of meadows (Oppermann and Gujer 2003).

Other schemes focus on the preservation of key animal species. For example, Zabel and Holm-Müller (2008) detail a Swedish outcome-based scheme to encourage the reproduction of large carnivores (lynx and wolverines) on reindeer grazing lands. In the Netherlands, similar outcome-based approaches have been targeted at improving the breeding success of meadow-bird species. For example, Musters et al. (2001) conducted a trial on using per-clutch payments to preserve nesting lapwings and black-tailed godwits, and Verhulst et al. (2007) similarly studied the use of per-clutch payments to enhance wader breeding success within Dutch agricultural cooperatives. A scheme in Schleswig-Holstein paid farmers for the conservation of four endangered bird species, differentiating between single breeding pairs and entire colonies (Stapelholmer Naturschutzvereine 2007).

The environmental targeting in these European PES examples concentrates on biodiversity conservation, with a particular focus on grassland habitats and plant species, coupled with few examples focusing on specific animal species. The focus of on site-specific single objective schemes reflects the complex nature of implementing landscape-scale PES targeting multiple ecosystem services.

Environmental land management initiatives in the EU tend to be designed in a largely top-down fashion, driven by governmental institutions seeking to deliver the goals of national legislation, policy obligations and international directives and conventions. However, PES aimed at halting environmental decline need to pursue a more holistic and synergistic multi-objective approach that inspires and brings together farmers and local communities (Dwyer and Short 2011). In order to fully utilise the potential of outcome-based PES to deliver different ecosystem services, Schwarz et al. (2008) conclude that the policy focus needs to

shift from top-down contractual agreements with individuals, to integrating local governance into PES design and delivery and supporting self-governance of groups of land managers.

Table 1 provides an overview of outcome-based schemes in Europe, based on a review in Schwarz et al. (2008).

Table 1: Overview of European result-oriented agri-environmental measures

Examples	Country / Region	Objective	Ecological targeting	Outcome-based mechanism
Farm Conservation Scheme	Peak District National Park, England	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species and differentiate between different ecological qualities
East of Scotland Grassland Management Scheme	Eastern Scotland	Biodiversity conservation on grasslands and lowland fens	Plant species / grassland habitat	Payments based on habitat indicators
Preservation and advancement of biodiversity on farmland	Switzerland	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species
MEKA programme	Baden-Württemberg, Germany	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species/genera
NAU/BAU programme	Lower Saxony, Germany	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species and differentiate between different ecological qualities
Conservation & enhancement of species-rich grassland	Brandenburg, Germany	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species
Flowering Meadows	Regional nature and national parks, France	Biodiversity conservation on grasslands	Plant species / grassland habitat	Payments based on indicator species/genera
Meadow Birds Agreement	Netherlands	Conservation of breeding waders	Animal species / grassland habitat	Payments for the number of clutches on the farm land
Breeding Birds Contracts	Local area in Schleswig-Holstein, Germany	Conservation of breeding birds and bird colonies	Animal species / grassland habitat	Payments for endangered bird species differentiated between single breeding birds and colonies
Conservation Performance Payments	North Sweden	Conservation of carnivores on reindeer grazing land	Animal species	Payments per carnivore offspring, also differentiating between regular and occasional occurrence
Reduction of N-emissions (RDP)	Brandenburg, Saxony Anhalt, Thuringia	Enhancement of water and air quality	Diffuse pollution Field N-surpluses as indicators	Payments linked with field N-surpluses as indicators. Some management prescriptions defined
Higher Level Stewardship	110 areas across England	Wide range of objectives with regional targeting maps	Farm habitats	Payment based on indicators of success and prescriptions
Oekopunkte-Programme	Federal State of Lower Austria	Maintenance and enhancement of the ecological and recreational value of cultural landscapes	Farm habitats	Payments based on accumulated bonus points for specific actions and outcomes
IAEP approach	Theoretical experiment, Sweden	To enhance public good provision	Multiple public goods	Payments based on state indicators

Source: Expanded based on Schwarz et al. (2008).

KEY ISSUES FOR THE IMPLEMENTATION OF OUTCOME-BASED PES

Although farmers' understanding of providing (or "producing") ecosystem services will initially be limited, over time they may be able to apply the same skills developed for conventional production in the pursuit of providing ecosystem services. Outcome-based approaches may expose farmers to greater risks of non-payment due to the uncertain nature of future environmental change. A range of external factors can affect the outcome of management activities. Such risks need to be taken into account in the design and timetable of payments. First of all, farmers need more flexibility to respond to climatic events, but fixed prescriptions in action-based payments (e.g. fixed mowing dates) restrict their ability to do so (Burton and Schwarz 2013). At the same time, combining outcome-based payments with an action-based base payment limits the risks for participating farmers. Some flexibility in defining and controlling the requirements for qualifying for outcome-based payments could also be implemented to account for factors beyond the control of the farmers. For example, in the case of grassland biodiversity payments, as long as the threshold of indicator species was fulfilled in four of the five contract years, full payments would be received (Schwartz et al. 2008).

However, empirical evidence on how the additional risk of outcome-based payments affects acceptance by farmers is limited. Based on a study of MEKA farmers,[2] Matzdorf and Lorenz (2010) conclude that the potential risk does not have a clear negative impact on the willingness to participate in the scheme. They report that of the 27% of farmers who failed to meet the required number of indicator species, only 13% were affected by factors beyond their control and only 5% were deterred from the project by the risk of a negative outcome.

Outcome-based payments provide an incentive to choose land for ecosystem services production that will yield the best environmental results (Matzdorf et al. 2010). This negates the "selectivity effect", where land entered into programmes is often simply the poorest land (Ilbery and Bowler 1998). What needs to be further investigated is to what extent this can encourage farmers to develop a whole-farm approach to environmental measures, which researchers have suggested is likely to deliver the greatest environmental benefits (e.g., Mander et al. 1999; Butler et al. 2007).

Furthermore, the issue of quantifying the "appropriate" payment level according to the different environmental outcomes remains a challenge. There is an apparent inconsistency in existing examples, in the sense that outcome-based payments are still based on agricultural income forgone and additional costs incurred. The risk of trade distortions and, generally, narrow interpretations of current World Trade Organization rules restrict the methods that can be used to calculate payments for agri-environment measures and make it difficult to provide truly outcome-based payments. In some cases auctions have been tested as a tool to quantify payment levels. Auctions provide a way to consider the heterogeneity of compliance costs of scheme participants in the quantification of payment levels.

While the potential of auctions to improve the cost-efficiency of PES can be limited in practice due to strategic behaviour of farmers and learning about bid caps, the positive impacts auctions on the cost-effectiveness of policy measures have been confirmed in a number of empirical studies (Claassen et al. 2008; Stoneham et al. 2003; White and Burton 2005; Latacz-Lohmann and Schilizzi 2007; Latacz-Lohmann and Schilizzi 2011). The potential of auctions to further improve efficiency and environmental targeting of outcome-

[2] The MEKA programme in Baden-Württemberg is one of Germany's agri-environmental schemes.

based payments suggests benefits from more application, in particular as auctioning is permitted under Council Regulation (EC) No. 1698/2005.[3]

Matzdorf and Lorenz (2010) conclude that the outcome-based schemes in Baden Württemberg aimed at preserving species-rich grassland had a positive effect on cost efficiency. Groth (2009) estimated a potential of 21% to 36% cost effectiveness gains for one of the prototype schemes in Lower Saxony. Burton and Schwarz (2013) conclude that despite these positive signs, the cost-reduction potential of outcome-based schemes remains largely theoretical, and more empirical studies of outcome-based measures are needed.

Overall, the experience from existing outcome-based PES examples highlights the potential for this approach to improve the delivery of ecosystem benefits through the CAP. Outcome-based PES explicitly link payments to the fulfilment of the desired ecosystem service benefit and thus directly address the conditionality requirement. Ecological results of the early outcome-based PES have been positive, although the impact of the outcome-based component of environmental programmes is often difficult to distinguish from action-based results. None of the reviewed studies suggest that the outcome-based approach failed, and the response of land managers to the approach was seen as overwhelmingly positive across the studies. However, a number of key issues such as risk, farmers' acceptance, indicator design, and targeting multiple objectives and ecosystem services need to be further tested through the implementation of more prototypes – e.g., implemented in combination with existing action-based agri-environmental payments.

Barriers to a more flexible and territorial policy approach

The issue of a more flexible interpretation of the legal policy framework is closely related to the need for flexibility to account for the large diversity of agriculture and environmental conditions across the EU. Extensive farming systems with a large share of high-nature-value farmland, often in peripheral rural areas, require different policy and payment approaches to deliver ecosystem services than intensive farming systems in highly productive areas. In addition, the state of the environment and related ecosystem services varies greatly, again requiring a flexible policy framework to address spatially explicit environmental issues. The scope for further including territorial policy approaches for local targeted actions should further be explored (Dworak et al. 2010). One of the main barriers to a more flexible and territorial policy approach is the expected higher administration cost to implement and monitor such approaches. In a policy framework driven by top-down central approaches, concerns about higher administrative costs are a key constraint for policy innovations.

A comprehensive overview of barriers to PES implementation is provided by Rowcroft et al. (2011). The authors differentiate between information, technical, spatial, temporal, financial, institutional, cultural, and legal factors as well as equity considerations.

Many ecosystem services suppliers (i.e., land managers) and buyers (i.e., government agencies / public bodies or private companies or local communities) might not be aware of their roles. In particular, potential buyers of ecosystem services are often unaware of their dependence on these services, and limited access to information about PES contributes to the lack of awareness (Rowcroft et al. 2011).

Information on the relationship between the type of land use supported and the provision of ecosystem services is crucial (DEFRA 2010). However, more research is needed on the complex relationships between ecological and bio-physical processes and the provision of

[3] See http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:277:0001:0040:EN:PDF.

ecosystem services. The existing capacity to develop linkages between biodiversity and ecosystem services at spatial scales relevant to the human enterprise is limited at present (Balvanera et al. 2006).

Another barrier for the implementation of PES is that buyers (e.g. government agencies) perceive a risk of leakage through the implementation of PES. Leakage refers to the displacement of activities which damage service provision in areas outside the geographical zone of the PES. Wunder et al. (2008) argue that leakage can occur at the local level or indirectly at a broader level. Whether or not leakage is a concern for more localised PES depends on the scale of intervention – for example, whether the entire watershed is included, or only part of it. In other words, the risk of local leakage can be reduced by carefully designing the PES contracts and their monitoring (Wunder et al. 2008). Rowcroft et al. (2011) argue that indirect leakage is of particular concern in larger-scale, government-financed programmes.

However, while there clearly are a number of challenges associated with the implementation of effective PES, none of the discussed barriers presents unsolvable problems, nor should they be used as a reason to avoid further use of PES. Careful selection of the ecosystem services to be provided, together with targeted programme design, can address many of the challenges involved in delivering PES schemes (Rowcroft et al. 2011).

Table 2: Barriers to PES implementation

Factors	Barriers
Informational	Lack of awareness among beneficiaries and providers
Technical	Scientific uncertainty Establishing baselines Diffuseness Appropriate programme size Avoiding leakage Ecosystem valuation Excludability and free riding Shortage of skills and experience
Spatial	Spatial variability
Temporal	Permanence Time lags Differing time horizons
Financial	Perceived risks High start-up costs High administration and transaction costs
Institutional	Collective action problems Perverse incentives Complex policy environment
Legal	Property rights and other issues
Cultural	Aversion to paying for ecosystem services Lack of trust among land managers Terminology
Equity consideration	Perceived unfairness

Source: Rowcroft et al. (2011)

CONCLUSION

PES are widely used as market-based incentives to promote the provision of ecosystem services from agricultural (and non-agricultural) land management. PES can be classified according to the number of ecosystem services targeted (single vs. multiple), financing arrangements (government versus private) and the implemented payment approach. Outcome-based PES explicitly link the payment to the fulfilment of the desired ecosystem service benefit and thus directly address the conditionality requirement. Ecological results of the early outcome-based PES have been positive, although the impact of the outcome-based component of environmental programmes is often difficult to distinguish from action-based results. None of the reviewed studies suggested that the outcome-based approach failed, and the response of land managers to the approach was seen as overwhelmingly positive across the studies.

Relatively few outcome-based PES have been developed within the CAP framework; our review looked at one initiative targeting grassland biodiversity in the regional rural development programmes in Germany; water quality measures in three German federal states (although not fully outcome-based), and the addition of outcome-based elements such as bonus payments to otherwise rather action-based schemes (Higher Level Stewardship Scheme in England). Most of the European examples of outcome-based PES, however, have been funded through local programmes outside the framework of the CAP and, as a consequence, have not received the same level of EU funding as the EU co-funded action-based agri-environmental payments under the second pillar of the CAP. However, the implementation of outcome-based PES in German rural development programmes shows that this approach conforms to the current institutional framework of the second pillar of the CAP (Matzdorf et al. 2010) and suggests that with a broader interpretation of the WTO requirements, there would be more scope for implementing outcome-based PES.

While a number of PES are targeted at wider ecosystem services (e.g., carbon sequestration), most of the outcome-based examples focus on site-specific environmental objectives, in particular in Europe, reflecting lower requirements in scheme implementation and monitoring. However, potential lessons learnt from the more complex index-based schemes in Australia for future PES within the framework of the CAP merit further investigation.

Establishing outcome-based PES delivering ecosystem services on a wider scale needs to be accompanied by a shift in the policy focus from top-down driven contractual agreements with individuals to integrating local governance into PES design and delivery and supporting self-governance of groups of land managers. A potential role of participatory approaches and other bottom-up approaches should be further explored to develop alternative institutional arrangements and to integrate local governance into PES design and delivery.

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Baltic Compass

Baltic COMPASS promotes sustainable agriculture in the Baltic Sea region. The region's 90 million inhabitants anticipate both high quality food produced in the region and a healthy environment, including a cleaner Baltic Sea. Baltic Compass looks for innovative solutions needed for the future of the region and its agriculture, environment and business.

Baltic Compass has a wide approach to the agri-environmental challenges, covering agricultural best practices, investment support and technologies, water assessment and scenarios, and policy and governance issues.

Baltic Compass is financed by the European Union as a strategic project for its support to investments and policy adaptation. The 22 partners represent national authorities, interest organizations, scientific institutes and innovation centres from the Baltic Sea Region countries. Baltic Compass is a three year project running until December 2012.

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