



Final Report for Phase I of ENTWINED 2007-2009

**Realising an ambitious workplan and
laying the foundation for Phase II**

Report Series 2010-AR

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Summary

On behalf of the ENTWINED research programme, I am pleased to submit our Final Report for 2009. This report sets forth the activities undertaken by the programme's first phase and provides a picture of our accomplishments over the last three years. ENTWINED – *Environment and Trade in a World of Interdependence* – was initiated January 2007 in response to a Mistra call for research on “policy alternatives for managing the trade and environment interface” which reflected the need to investigate how to better integrate environmental aspects into international trade negotiations in our increasingly entwined global economy. Mistra has awarded funding for ENTWINED for a seven year period through to the end of 2013.

ENTWINED's activities are timely and topical and contribute to solutions for important questions in the shadow of difficult economic times and rising concern for our global environment. Our objective is *“to provide scientific knowledge, and to provide tools to support Swedish and other European negotiators and stakeholders in integrating environmental aspects into the international trade regime”*. At a more practical level, our objective is to on the one hand study issues at the intersection of international economics, environmental economics and trade law, and on the other hand to engage on issues with stakeholders who have a role to initiate change. Taking both a positive and a normative point of view, ENTWINED aims first to identify when trade and environment act in concert or at cross purposes and second to suggest alternatives to allow for simultaneous achievement of trade and environmental objectives.

The highlights of the year would not have been possible without the ENTWINED team. Each member of our compact team has contributed to the success of the programme. In March 2009, ENTWINED met for a two day internal workshop where we had the chance to share our research, discuss ideas, and refine our workplan. During the year we have continued to delivered research outputs and have also continued to publish papers in peer reviewed journals. At the same time, we have set out to engage with our targeted stakeholders and been able to deliver clear and constructive input to difficult debates.

I would like to thank the ENTWINED team for their support. The researchers have according to our evaluation delivered outstanding scientific quality and have contributed the ambitious objectives that we have set for the programme. Furthermore, on behalf of the researchers, I would like to thank our programme board for their active engagement and interest in our work. They have made a significant contribution to our programme and we recognize the value that they have added to our work.

Already after three years, ENTWINED has worked together to continue; yielding a large number of high quality studies; examining a range of policy-relevant issues in the designated programme areas; writing for academic as well non-academic readership, and engaging in the broader trade and environment debate through their participation in a range of different events to communicate research findings. In short, ENTWINED in 2009 has delivered according to an ambitious agenda and delivered according to plan. This report begins with a description of the work undertaken by ENTWINED to date before moving on to present the financial status of the programme.

Sincerely,



Mark Sanctuary
Programme Director – ENTWINED
IVL Swedish Environmental Research Institute
1st April 2010

ENTWINED Events and Research

This report sets forth the activities undertaken by the programme and provides a picture of our accomplishments over the last three years. ENTWINED – *Environment and Trade in a World of Interdependence* – was initiated January 2007 in response to a Mistra call for research on “policy alternatives for managing the trade and environment interface” which reflected the need to investigate how to better integrate environmental aspects into international trade negotiations in our increasingly entwined global economy. Mistra has awarded funding for ENTWINED for a seven year period through to the end of 2013. The programme’s first phase spanned from 2007 through to 2009 and this final report covers the activities and milestones of this first phase.

ENTWINED’s activities are timely and topical and contribute to solutions for important global environmental questions in the shadow of difficult economic times and a rising concern for our environment. Our objective is “to provide scientific knowledge, and to provide tools to support Swedish and other European negotiators and stakeholders in integrating environmental aspects into the international trade regime”. At a more practical level, our objective is to on the one hand study issues at the intersection of international economics, environmental economics and trade law, and on the other hand to engage on issues with stakeholders who have a role to initiate change such as decisionmakers in government agencies at the national, European and multilateral levels. Taking both a positive and a normative point of view, ENTWINED aims first to identify when trade and environment act in concert or at cross purposes and second to suggest alternatives to allow for simultaneous achievement of trade and environmental objectives.

A fundamental aim of Mistra-sponsored programmes is that they shall not only produce academic research of the highest quality, but also engage programme participants in dialogue with practitioners in the field of research. The ENTWINED programme bridges this divide by producing both high-quality applied academic research, as well as through the support of communication and outreach events. This has been made possible by the multidisciplinary nature of the research team, which includes researchers specializing in environmental economics, natural resource economics, international economics and trade law. Even if the programme has its focus in Sweden, it engages leading experts in a number of other locations, including Geneva, New York, Washington and Montreal.

ENTWINED Phase I has *realised an ambitious agenda, delivered according to plan and contributed further understanding on critical policy-relevant issues on trade and the environment*. From the beginning of the programme, the research team had worked to identify issues that not only make good research but are also important for policymaking. This was in fact our first step in establishing the programme’s

key messages and it provides us with a solid basis for moving ahead with Phase II, which will see a shift in emphasis towards dialogue and communicating and supporting the dissemination of our results.

Program Highlights of 2009

This report provides an account of our accomplishments throughout our three years of activity but there are a few milestones from 2009 that we would like to highlight for the reader.

In May of 2009, ENTWINED co-hosted a conference with Geneva based International Centre for Trade and Sustainable Development and the Washington based ENTWINED partner Resources for the Future¹. The dialogue focused on trade and climate and the development aspects of climate change policies of OECD countries. OECD countries are in the process of legislating responses to the challenges posed by climate change. The prospect of rising carbon prices raises concerns in these nations of the impacts on the competitiveness of their own energy intensive industries and the potential for carbon leakage, particularly to emerging economies that lack comparable regulation. As a response, OECD countries are considering incorporating trade-related measures into their climate policies. Some of these have been perceived as potentially harming industries in developing countries while arguably achieving limited results in mitigating total global carbon emissions. Others have been more acute in stating that these trade policy measures are more inclined to protect the competitiveness of domestic industries in OECD countries and, as such, partake the nature of disguised restrictions to trade.

With the assumption into office of the Obama Administration and its renewed prioritization of climate change issues, the United States Congress has ratcheted up deliberations on various bills, such as the Boxer-Lieberman-Warner Climate Security Act (S. 3036) and the Waxman-Markey American Clean Energy and Security Act (draft text). Regulations at the sub-federal or state level are likewise increasingly relevant vis-à-vis federal policies. In the European Union, member economies are preparing the next phase of the 'Emissions Trading System' and considering options in the absence of a major international agreement to cap greenhouse gas emissions. Japan, Australia and Canada are also deep into consideration of analogous measures.

¹ The agenda is available online at: <http://www.rff.org/Events/Pages/Development-Aspects-of-Climate-Change-Policies-of-OECD-Countries.aspx>

Despite the obvious ramifications on their countries' trade competitiveness and sustainable development aspirations, many developing country trade policy-makers and negotiators remain at the fringe of the climate change debate. An enhanced level of understanding of the different approaches evolving among the key OECD countries is crucial if the various stakeholders are to have an enlightened dialogue on the development implications of OECD countries' domestic policies to address climate change.

In an effort to bridge the different spheres of knowledge and provide opportunity for an exchange of perspectives, particularly among those who are not often included in similar consultative processes, the International Centre for Trade and Sustainable Development (ICTSD) and the Environment and Trade in a World of Interdependence (ENTWINED) Programme have organized a dialogue among select representatives from developing country trade and/or economic ministries, think-tanks and universities, Geneva-based developing country ambassadors and OECD member country government representatives. The activity was hosted by Resources for the Future (RFF) in Washington DC. Thru this initiative, ICTSD and ENTWINED:

- (i) Explored the development aspects of selected OECD countries' domestic trade policies intended to address climate change, and
- (ii) provided a platform for interaction and exchange amongst trade negotiators/policy-makers, private sector representatives, academia and civil society from both OECD as well as developing countries.

In September 2009, ENTWINED co-hosted a seminar on Trade and Climate with Sweden's National Board of Trade. The seminar brought together leading academics, decisionmakers and practitioners to present and discuss, in an informal setting, some of the pressing challenges we face on international trade and the environment. It is increasingly being argued that some trade partners do not take their responsibility for the common environment, and, by neglecting the environmental impact of their production, not only do they impose environmental externalities on trade partners, but also gain commercial advantages at their expense.

Consequently, it is argued in many quarters that "we" have to impose taxes on foreign products that "they" dump environmentally. This is necessary both to protect domestic producers from unfair competition, as well as the environment. Of particular interest is the role of "border

adjustments” for environmental reasons, increasingly heard in relation to climate policy.² The Kyoto Protocol notwithstanding, to date countries are engaging in essentially unilateral policy efforts to curb greenhouse gas emissions, and there is concern that the costs these efforts impose will drive production, jobs, and emissions abroad, undermining the effectiveness of these measures.

We also see proposals in the U.S. and Europe that include allowance obligations for imports and/or preferential allocation mechanisms for trade-sensitive sectors. These proposals seek to offset commercial advantages that trading partners may gain from their regulatory choices.

These issues underline a basic potential conflict between the WTO’s purpose of constraining unilateral policy-making and the calls for more active unilateral and multilateral environmental policies. This potential conflict may become real if proposals for border adjustments for the environment are implemented. For one, WTO members are not free to select unilateral policies to target perceived deficiencies in other countries’ environmental policies. In particular, members still have to respect the non-discrimination obligations in the form of the Most-Favoured Nation clause, and the National Treatment clause. These issues were discussed and explored during the workshop.

In November 2009, ENTWINED hosted a launch of its book “A Sustainable Development Roadmap for the WTO” at the WTO in Geneva. The roadmap calls for the WTO to rethink its direction and goals, and then redesign a trade policy that meets the imperatives of environmental protection and the needs of impoverished and vulnerable sectors of society.

“Today we live in a small world where there is no room for pure mercantilism. The potential of the WTO to engage in sustainable development is enormous,” author Aaron Cosbey of IISD said.

WTO Director General Pascal Lamy thanked IISD for the Roadmap and agreed the WTO system could be improved. The question remains how.

Lamy said the WTO is not a “holistic” organization, but could more actively participate in the efforts of other specialized multilateral institutions and civil society organizations to address interconnected sustainable development issues in the context of a new approach to world trade.

² On Kyoto, see Bhagwati and Mavroidis (2007), and Barrett (2007). On the history of the discussion on border adjustments in the GATT see Démaret and Stewardson (1994). On the shaping of this discussion nowadays, see Charnovitz (2007).

Canada's permanent WTO representative John Gero said the Roadmap offered good suggestions on how to solve a number of issues, adding that it challenged conventional wisdom, and importantly emphasized the need for benchmarks for accountability.

Cosbey said the guide offers a message of hope, and acknowledges that many of the principles for sustainable development are already embodied in the founding text of the WTO.

"It is time for the WTO to do some serious soul-searching. For starters, it should convene an independent body of experts to recommend how it can make progress on these institutional issues, and to help decide which pieces of the larger sustainable development effort are appropriate to the WTO's mandate and expertise."

The basis for our high level engagement on these issues rests partly on the work conducted by our research team. Work during the first phase of the ENTWINED programme has yielded 20 studies covering two interrelated research areas. The first set of these studies seek to *make sustainable development operational within the WTO*. A core issue in this area is the extent to which the current WTO legal regime allows Members to regulate activities affecting the environment. This question has been addressed both in general terms and in application to the growing debate over the role of trade measures in climate policies, where concern over the lack of emissions pricing on the part of key trade partners has posed a major stumbling block toward adopting significant policies for reducing greenhouse gas (GHG) emissions. For example, we have produced several important results that target WTO legal experts and other stakeholders that are of practical and strategic use for solving important environmental problems. We have, for example, provided more clarity on the degree to which countries can deploy unilateral environmental policies within the WTO agreement. This result also delivers a practical methodological framework that can be applied to trade disputes over domestic environmental regulation or similar disputes. This will in turn increase the predictability and internal consistency of adjudication in WTO disputes. We have also identified inconsistencies in WTO adjudicating bodies' allocation of the burden of proof in environmentally relevant disputes, and point to a tendency for complainants to face a low burden of proof when contested measures are allegedly pursued for environmental reasons. Again, the findings are of immediate practical relevance to the outcome of environmental trade disputes between Members of the WTO. Moreover, this message helps support decision makers who play a key role in deciding the outcome of these disputes.

The second set of our studies explore *product standardisation and product chain policies*. This set of papers examine whether and how sustainable development can be promoted through mechanisms beyond those traditionally considered in the WTO disciplines, such as voluntary environmental standards in the form of e.g. "ecolabelling" and on the design of national and private policies to combat environmental externalities in international markets. ENTWINED has provided much needed

empirical research on the trade impacts of eco-labelling and other environmental standards, another area in which we are hoping to continue working. This is becoming increasingly important to consumers as they face an increasing array of environmental labels on the goods they purchase. ENTWINED has been able to contribute understanding on not only the distributional impact of eco-labels and voluntary standards but also their environmental impact. The results of this research are newsworthy and of direct interest to many in the general public.

Another facet to ENTWINED is that the programme has brought together experts who would not otherwise have cooperated. We work on Trade and Environment issues that are at the intersection of Environmental Economics, International Economics and Trade law and we are a blend of experts with not only a policy focus but also academic focus. The fruits of this collaboration are measured of course by the direct impacts our programme has and by what we deliver in accordance with our Programme Plans. However, there are indirect benefits that are also important. For example; Gothenburg University is hosting a course on Trade and Environment, drawing partly on the experience gained from ENTWINED; Petros Mavroidis and Carolyn Fischer are collaborating on a book review; and Henrik Horn is lecturing on Environmental issues at the Stockholm School of Economics.

A final point on this score is that each of ENTWINED's participants was chosen in part because of the networks they bring to the programme. This is an important contributing factor to the success of our work. IISD's work on these issues, for example, brought the WTO's Director-General Pascal Lamy to comment at an ENTWINED book launch in 2009. Also, Henrik Horn's work on "The Burden of Proof in National Treatment Disputes and the Environment", has influenced Henrik's work with the American Law Institute project Principles of World Trade Law: The World Trade Organization, a project he and Petros Mavroidis are heading that specifically aims to propose changes to the current case law interpretation of Art. III GATT. Our researchers intend to continue leveraging their skills and networks to meet the objectives and contribute to the realisation of the programvision. In the next section these activities and accomplishments will be presented in more detail. Our publications are available on our website: www.entwined.se.

The subprojects

Making Sustainable Development Operational Within the WTO

Studies under this heading focus on the constraints, or the lack thereof, imposed by the WTO on the national pursuit of policies that address, or at least are said to address, environmental externalities. The agreement seeks to strike a balance between on the one hand preventing

protectionism, and on the other hand allowing member states to pursue non-discriminatory environmental policies. The central question in this regard is how an appropriate balance is to be achieved in a world where the true motives of national policies are often hard to detect.

(1) The paper “**The Permissible Reach of National Environmental Policies**“, Journal of World Trade 42(6), 2008, 1107-1178 by Henrik Horn and Petros C. Mavroidis³, addresses the territorial ambit of national environmental policies within the context of multilateral trade liberalization. The WTO Agreement does not prescribe this issue at all. The paper starts from the observation that WTO Members are, in the absence of specific regulation, bound by the default rules regarding allocation of jurisdiction that are part of public international law. This is the first paper to explore the implications of these rules for environmental disputes. Examining the relevant case law, the paper first observes that adjudicating bodies have so far not given any explicit attention to the default rules. The paper then constructs a series of scenarios that seek to exhaust the type of situations where environmental protection may be used to address hazards occurring within or outside the jurisdiction of the regulating state. These scenarios are employed to discuss likely outcomes of disputes, had such scenarios been submitted as disputes before WTO adjudicating bodies and had the default rules regarding allocation of jurisdiction been respected by the WTO judge. The paper concludes that for the scenarios that capture already adjudicated disputes, the outcomes of disputes would for the most part not be changed compared to existing case-law, would the default rules had been taken explicitly into account. However, adjudicating bodies’ argumentation could have been made significantly clearer and would look different under the double condition of absence of physical effects in the regulating state and absence of moral externalities. The intended practical import of this paper is to provide a methodological framework within which similar disputes should be adjudicated, in order to increase the predictability and internal consistency of adjudication in WTO disputes.

(2) Jason Potts examines the “**The Legality of Process and Production Methods under the GATT**“, a topic that falls equally well under the heading “Making Sustainable Development Operational within the WTO”, as under the heading “Product Standardization and Product Chains Polices”, in the initial Mistra call. Since the Tuna-Dolphin cases in the mid-’90s, the treatment of process and production methods (PPMs) under the GATT, and subsequently the WTO, has been a pivotal point of debate and controversy for environmentalists, policy-makers and industry alike.

³ Shorter version as “Trade, Environmental Policies and the Role of Jurisdiction in the WTO“, Giergerich, Thomas and Alexander Proelß (eds), *Bewahrung des ökologischen Gleichgewichts durch Völker- und Europarecht*, Band 174, Duncker & Humlot

And while governments and other stakeholders have since openly recognized the importance of policy that takes into account the nature of the processing and production methods, a general myth on the illegality of PPM-based policies within the WTO has persisted. Following an examination of the alleged grounds for this conclusion, as well as recent decisions by the WTO Appellate Body, the paper concludes not only that there is no basis for the assumption that PPM-based policy is a priori illegal under the WTO, but also that the legality of any given measure is favoured by taking guidance from basic principles of sustainable development such as economic efficiency, science-based decision-making and international cooperation. Building from this observation, the paper concludes by outlining a series of targeted strategies for the design of WTO-compliant PPM policy.

(3) Aaron Cosbey examines the potential role and eventual challenges faced by “**Border Tax Adjustments**” in the context of international climate negotiations. As governments around the world seek means for pricing carbon in national markets, there is a corresponding need to find ways to adjust the pricing mechanism for foreign goods. Border adjustments have frequently been suggested as a possible instrument for leveling the competitive playing field by taxing products based in accordance with their carbon footprint. A review of the probable legal treatment of border adjustments under the WTO suggests the potential legality of such measures). However, the paper argues that two other extenuating factors make this kind of border adjustment an unpalatable option: First, the practical challenges facing accurate measurement of the carbon profile of individual products on a global basis are daunting. Second, the implementation of unilateral border tax measures might have important negative impacts on the current climate negotiation process. This paper concludes that research on the precise means by which border tax instruments might function at a practical level needs to be conducted before policy decisions in their support at a high level are made.

(4) In addition to the legal, political, and practical aspects, the debate over border adjustment options must be informed by a better understanding of the economic and environmental consequences. In “**Comparing Policies to Combat Emissions Leakage: Border Tax Adjustments versus Rebates**” Carolyn Fischer and coauthor Alan K. Fox explore the conditions determining which anti-leakage policies might be more effective complements to domestic GHG emissions regulation. They consider four policies that could be combined with unilateral emissions pricing to counter effects on international competitiveness: a border tax on imports, a border rebate for exports, full border adjustment, and a domestic production rebate (as might be implemented with output-based allocation of emissions allowances). Each option faces different potential legal hurdles in international trade law; they also have different economic impacts. The authors show that, while all have the potential to support domestic production, none is necessarily effective at reducing global emissions. Nor is it possible to rank order the options; in each case, the

effectiveness depends on the relative emissions rates, trade sensitivities, and consumption volumes. They illustrate these results with simulations for the energy-intensive sectors of two different economies, the U.S. and Canada, and discuss the tradeoffs associated with anti-leakage policies.

(5) In “**A Sustainable Development Roadmap for the WTO**” Aaron Cosbey provides an overview of the current and future political context regarding current WTO negotiations and further developments in the WTO legal regime. The paper considers the WTO context in relation to four key themes: (i). trade law and environment; (ii). Negotiations; (iii) dispute settlement; and (iv) assessment. With respect to trade law and the environment, Cosbey highlights the need to focus efforts on environmental goods and services negotiations; subsidies reductions - particularly in fisheries - and ensuring consistency between the implementation of the TRIPs agreement and environmental objectives. With respect to trade negotiations, Cosbey notes that the manner in which negotiations are currently carried out faces serious coordination problems which, ultimately, reduce that ability of negotiations to deal with key sustainability (public good) issues. Cosbey suggests that this challenge might be addressed by providing better access to actual empirical results on the sustainability impacts of trade, through an “Intergovernmental Panel on Trade and Sustainable Development” (ITPSD), modelled after the IPCC. With respect to dispute settlement, the paper notes the need for improved openness and predictability with respect to dispute settlement processes. The paper concludes by noting a general need for improved assessment of the WTO negotiations and related legal framework suggesting that the establishment of an ITPSD could provide a significant stepping stone to more strategic and fruitful negotiation outcomes.

(6) The paper “**The Burden of Proof in Environmental Disputes in the WTO: Legal Aspects**”, *European Energy and Environmental Law Review* 18(2), 2009 written by Henrik Horn and Petros C. Mavroidis⁴, discusses the manner in which burden of proof (BoP) has been discussed in WTO cases of concern to national environmental regulation⁵. The allocation of burden of proof is not explicitly regulated in law; according to the dominant opinion in doctrine it is integral part of the so-called implied powers of WTO adjudicating bodies. The WTO judge has provided a rule of thumb on the burden of production (who carries the BoP?), although not always in a consistent manner; it has failed to provide a rule of thumb as to the burden of persuasion (how much proof is necessary for the burden of production to shift to the other party?), and, as a result, recourse to

⁴ A slighter shorter and reworked version published as “Environment, Trade, and the WTO Constraint: Bop Till You Drop?”, *Révue Hellénique de Droit International*, 2009, 62: 1 – 63.

⁵ A slighter shorter and and reworked version published as “Environment, Trade, and the WTO Constraint: Bop Till You Drop?” *Révue Hellénique de Droit International*, 2009, 62: 1-63.

case-law is necessary to deduce trends in this respect. This paper is the first to discuss the allocation of BoP in disputes regarding environmental protection under all WTO agreements regulating trade in goods while asking the question whether the allocation has been reasonable in light of the objectives sought by the various agreements. The main conclusions are two-fold: in the relatively incomplete GATT, the judge has erred on the side of burden of persuasion, by requesting too little evidence from the plaintiff and thus, opening up the road for type I errors; in relatively complete agreements, such as the Agreement on Technical Barriers to Trade (TBT) and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS), the judge has erred not only on the side of burden of persuasion, but also on the side of burden of production, by wrongly allocating the burden of proof to the plaintiff; it is still too early to decide on the impact of such allocation on the relevance of international standards, it is however, safe to conclude that the outcome of the dispute becomes unpredictable as a result of the allocation.

(7) The paper “**The Burden of Proof in Environmental Disputes in the WTO: Economic Aspects**”, by Henrik Horn, focuses on the role of the BoP in National Treatment (NT) disputes, NT being the basic potential obstacle to the unilateral pursuit of environmental policies. Broadly speaking, NT in the GATT requests of countries to pursue their domestic policies -- including environmental policies -- in a non-discriminatory fashion. The problem facing the implementation of this type of provision is that adjudicators cannot independently observe whether a contested measure represents pursuit of legitimate objectives or protectionism, and will therefore have to rely on evidence presented by the parties to a dispute, an essential determinant of the actual bite of Art. III GATT is therefore the distribution of the BoP in such disputes. For instance, it seems intuitively plausible to make a significant difference to the expected outcome of an environmental dispute, if the contested measure will be declared illegal unless the regulating country establishes the consistency of the measure with Art. III, or if it will remain legal until the exporting country establishes that the measure violates this Article; both these principles can be found in case law. This paper seeks to illuminate the nature of these differences, focusing on the potential conflict between the benefits from exploiting gains from trade, and the costs of restraining national regulations of legitimate environmental policies. The paper is the first to formally analyze the working of NT from such a perspective, in a setting where the provision is explicitly motivated by a lack of knowledge on part of adjudicators of the true motives behind seemingly discriminatory taxation. While theoretical, the ultimate purpose of the paper is to serve as a stepping stone toward concrete proposals for how to reinterpret and/or reformulate Art. III.2 GATT, such stepping stones being necessary in order for the proposals to have support in economic theory. The paper

has now received a “revise and resubmit” from the “Journal of Environmental Economics and Management”, and initial work on the revision started toward the end of 2009.

(8) The paper “**The Global Effects of Subglobal Climate Policies**”, by Christoph Böhringer, Carolyn Fischer and Knut Einar Rosendahl, examines the implications of individual OECD countries unilaterally legislating responses to the challenges posed by climate change. The prospect of rising carbon prices raises concerns in these nations of the impacts on the competitiveness of their own energy intensive industries and the potential for carbon leakage, particularly to emerging economies that lack comparable regulation. As a response, controversial trade-related measures and allowance allocation designs are being proposed to complement their climate policies. Missing from much of the debate on trade-related measures is a broader understanding about how climate policies implemented unilaterally (or sub-globally) affect all countries in the global trading system. Arguably, the largest impacts are from the targeted carbon pricing itself, which generates macroeconomic effects, terms-of-trade changes, and shifts in global energy demand and prices, in addition to changing the relative prices of certain energy-intensive goods. This paper studies how climate policies implemented in certain major economies (the EU and the US) affect the global distribution of economic and environmental outcomes, and how these outcomes may be altered by a variety of complementary policies aimed at addressing carbon leakage.

(9) The paper “**Border Carbon Adjustments and the WTO**” by Henrik Horn and Petros Mavroidis discusses how a WTO adjudicating body would likely adjudicate a dispute concerning the legality of a Border Carbon Adjustment/Border Tax Adjustment scheme under the GATT, and we juxtapose it to our own preferred approach. There are some noticeable differences in the two approaches, the main one being the manner in which the two approaches control for the default rules allocating jurisdiction across states under public international law. In the authors view, relying on the default rules is a matter of legal compulsion anyway. But explicit reliance on the default rules would lead adjudicating bodies to an examination of the reasonableness in the exercise of jurisdiction, a review which is alien to the requirements of the GATT substantive obligations. The authors proposed approach allows WTO panels to thwart unwarranted exercises of jurisdiction (that is, cases where no interest to regulate exists other than maybe protectionism). It also opens up the door to the legal relevance of multilateral environmental treaties (MEAs) that have been and are being concluded to address global environmental concerns.

Product Standardization and Product Chain Policies

The studies under this part of the programme focus on the design of national and private policies to combat environmental externalities in international markets. The studies undertaken here look at different aspects of this issue in turn.

(10) In “**Does trade help or hinder the conservation of natural resources?**” commissioned for a special issue of the *Review of Environmental Economics and Policy*, Carolyn Fischer reviews the important influence that trade exerts over the exploitation and protection of natural resources. Indeed, recognition of this influence is codified in the GATT, which allows exceptions to the treaty obligations for measures “relating to the conservation of exhaustible natural resources,” motivates the Convention on International Trade in Endangered Species, and underlies the Convention on Biological Diversity. Fischer explains that trade impacts operate through several vectors. Trade liberalization changes relative prices, which affect exploitation incentives. Trade can also have broader equilibrium effects, such as on factor markets and incomes, which may affect demand for resource-intensive products or for ecosystem services. Trade interacts with and can influence the institutions governing the management of natural resources. Finally, trade can also be a direct vector for introducing threats to ecosystems in the form of invasive species. All of these factors pose special challenges for the conservation of renewable resources, which inherently involves dynamic economic and ecological processes. This article takes stock of the lessons from the recent resource economics literature on trade and conservation.

(11) International trade may also play a role in the location and scale of pollution-intensive manufacturing, but the literature has offered complex and conflicting results. The study “**Have Countries with Lax Environmental Regulations a Comparative Advantage in Polluting Industries?**” By Miguel Quiroga, Martin Persson and Thomas Sterner, examines the evidence concerning the belief that countries use less stringent environmental policies to gain a comparative advantage in polluting industries. The paper address this concern by investigating to what extent differences in environmental policy among countries is a source of comparative advantage. The subjacent hypothesis asserts that lax environmental standards extend the availability of environmental inputs in the production process, reducing environmental control costs and increasing net exports in pollution-intensive sectors, the so-called pollution-haven effect, described by Copeland and Taylor. Although some theoretical research supports this proposition, empirical studies have not found robust results corroborating the hypothesis. The paper studies whether lax environmental regulations induce comparative advantages, causing the least-regulated countries to specialize in polluting industries. The study is based on the factor content of trade. For the econometrical analysis, a cross-section of 71 countries is used to examine the net exports in the most polluting industries in the year 2000. The paper tries to overcome three problems in the earlier literature: the measurement of environmental endowments or environmental stringency, the possible endogeneity of the explanatory variables, and the influence of the industrial level of aggregation. As a result, it is found that industrial aggregation matters and some limited evidence in favor of the pollution-haven effect.

(12) In the study titled “**Voluntary Standards and Agricultural Markets**” Jason Potts reviews the last two decades of growth in the number of voluntary standards designed to define and enforce sustainable production across agricultural supply chains. In any given product area, several voluntary standards are often applicable, rendering it increasingly difficult for stakeholders to determine what products match their own set of consumption and production values. As institutional decision makers become increasingly interested in integrating sustainability concerns within their respective procurement policies, there is a growing need to benchmark different standards against commonly accepted sustainability principles. The Voluntary Standards and Agricultural Markets paper provides an overview of the current market and institutional developments within the agricultural voluntary standards. This serves as a basis for a more in-depth survey of the principle characteristics of diverse international standards along the following core social, economic and environmental parameters. The paper concludes by recommending increased investment in impact assessment of sustainability standards and ensuring good governance across voluntary standards initiatives.

(13) In the study “**GMO food in the European Union: Are policies likely to be protectionist?**”, Håkan Eggert and Mads Greaker (2008), look at how different government policies on trade in Genetically Modified Organisms (GMOs) affect food market structure, and how the total welfare contribution from any particular food market may change. In the ongoing Doha negotiations trade with agriculture products is still one of the major issues. GMOs provide the fastest adopted crop technology in recent history. Despite the obvious potential gains, the production of GMOs is concentrated to a few countries where USA, Argentina, Brazil, Canada, India, China and Paraguay provide 98% of global production. Food with inputs from GMOs has met considerable skepticism among European Union (EU) consumers. The EU import ban on GM food has triggered a great deal of controversy and has been replaced by a mandatory labeling scheme. A significant and substantial willingness to pay for GM-free food is found by several studies. The content of GM inputs in food can neither be observed before purchase nor experienced after purchase. Hence, there exists a potential information problem. If GM food is cheaper to produce, there is a risk that only GM food will prevail despite the fact that there are consumers willing to pay for GM-free food. The paper finds that mandatory labeling often increases domestic welfare and, moreover, that it may also enhance global welfare. On the other hand, a trade ban is more likely to decrease global welfare. As expected, it is also found that the market effects of GMO policy depend crucially on the cost disadvantage of GM-free food, and the average willingness to pay for GM-free food. Clearly, both these features of GM-free food could vary depending on the type of food. Furthermore, adding welfare gains and losses in the different cases, a mandatory labeling scheme combined with a domestic restriction on the growing of GM crops may increase global welfare. Note that when brand loyalty is weak, foreign producers may

increase their profit with a mandatory GMO labeling scheme, even though they do not switch to GM-free food.

(14) Fishery commodities constitute a group of goods that is increasingly important as net export for developing countries, but the management of the resources they are often based on de facto open access. The paper “**Effects of global fisheries on developing countries – possibilities for income and threat of depletion**”, commissioned for a forthcoming volume *Fish, Trade and Development* (The Royal Swedish Academy of Agriculture and Forestry) by Håkan Eggert and Mads Greaker, focuses on the balance of increasing income by exploiting marine resource but avoiding depletion of the same. Trade is usually seen as a positive factor in improving the standards of living for a country’s population. Similarly, foreign direct investment or joint venture projects in poor countries offer an opportunity of technology diffusion and increased welfare. However, trade may be beneficial for welfare, but may be problematic for resource conservation. In fact, under open access when property rights are absent, trade can be detrimental not only to stocks but even reduce overall welfare for resource exporting countries. The urgency of addressing these matters is reinforced by the fact that over fishing nowadays is not only a matter of low yield and poor income, but a threat to marine ecosystems that may lose the essential capability to adopt and recover from external shocks. In order to address this problem more focus should be put on changing fisher motivation, by providing fishers with economic rights, and accompanying responsibilities, incentives can be turned right and governance improved. The authors also note that weak resource management corresponds to an export subsidy on producers, which could be met by countervailing duties under trade law, and that if agreements are made and ratified within WTO, measures against deviators like border tax adjustment could be considered. One urgent example for fisheries is subsidies, which clearly make things worse. OECD countries like Japan and EU members, but also Russia, Poland, Republic of Korea, and Taiwan should stop using subsidies and together with other WTO members promote a broader definition of subsidies, which can speed up the reduction. In addition, adjustment programs in order to get developing countries to abandon the subsidy exemptions available today are desirable.

(15) Global environmental issues such as biodiversity and climate change are increasingly important to citizens around the world, but are extremely difficult for governments to address with standard policy tools. Consumers may prefer environmentally friendly products, but on their own, they cannot determine the environmental quality of any given firm's product. In the absence of standards for production behavior related to the environment, many groups have put increasing effort into international market mechanisms such as ecolabeling. In some cases, industry takes the lead in developing labels, as in the case of Starkist's move to dolphin-safe tuna; in other cases, non-governmental organizations (NGOs) sponsor labels, such as the "Good Environmental Choice"

label created by the Swedish Society for the Conservation of Nature. In “**Competing Environmental Labels**” Carolyn Fischer and coauthor Tom Lyon study the incentives of these two types of sponsors, in a stylized framework. They compare the choice of stringency for an industry and NGO label, given the same market conditions, and then analyze how the standards would interact if they were to compete. They find that an industry group would prefer a weaker standard to an NGO whose sole objective is environmental quality. If both groups create a label, the industry would tend to weaken its standard, allowing greater choice between the more and less stringent standards for its members, who would collectively be better off. However, the environment may or may not be improved with more ecolabels—it depends on how much market share the industry label takes from the NGO label, versus how many new members adhere to the lower standard, and whether the NGO responds by tightening or loosening its own standard. That a simple framework can generate these ambiguities is telling; adding more realistic complexities, such as how consumers would perceive and respond to multiple labels, is likely to offer more situations in which expanding the number and coverage of ecolabels for environmental protection may have limited effectiveness, or even be counterproductive. Thus, the research issues some important notes of caution that a deeper understanding of specific product markets is needed to evaluate the likely benefits of multiple voluntary ecolabeling schemes.

(16) The transport sector is a major contributor to green house gas (GHG) emissions in the countries with an emission restriction in the Kyoto treaty (Annex B countries). Exchanging conventional fuels with biofuels is seen as one possible measure by which these emissions can be reduced. At the same time some of the countries without restrictions on GHG emissions, have or may develop comparative advantages in biofuels production. Agricultural production has long been a major area for trade negotiations as tariffs and other trade barriers as well as substantial subsidies for domestic production are still frequently used. In addition, many countries see benefits from reducing dependence on foreign import and increasing the level of self sufficiency regarding transportation fuels. Hence, there is a potential problem of carbon leakage and at the same time various measures to reduce GHG emissions may be used that in practice are subsidies or protectionism in disguise. In “**On Biofuels and Trade**” Håkan Eggert and Mads Greaker elaborate on various theoretical aspects of optimal trade policies with respect to biofuels, and also use some simulations to estimate the likely size of efficiency losses from various trade policies in an OECD country. Eggert and Greaker show that for the simple base case with zero subsidies, a tax on domestic fossil fuel consumption, and assuming land conversion with accompanying GHG emissions from biofuel production, the optimal policy is a positive tariff on imports of foreign biofuels. If one country only considers domestic welfare it will have an incentive to misuse a tariff and apply a beggar thy neighbor policy. The use of a proportional target of biofuels in conventional

fuels is shown to correspond to a tax on conventional fuels combined with a subsidy to all biofuels. However, as the optimal subsidy is zero proportional targets can never be optimal.

(17) What are the observed and expected impacts of sustainability standards on the distribution of revenue along international commodity supply chains? In answering this question, Jason Potts applies a Global Value Chain Analysis framework in “**Voluntary Sustainability Standards and Economic Rents: The economic impacts of voluntary sustainability standards in the coffee, fisheries, and forestry sectors**”. Global value chain theory was popularized in the early 1990s by Gereffi and Korzeniewicz (1994) as a way of conceptualizing the commercial linkages that transform raw materials into consumer goods.⁶ It provides a set of methodological tools for tracing economic activities at each stage, or “node”, of the chain of activities. Gereffi (1994; 1995) has identified four dimensions of value chain organization, which provide a useful framework for analyzing where economic value is generated and how it is controlled: 1) input-output structure, which describes how products and services are linked through value-added activities; 2) territoriality, meaning the spatial dispersion of activities; 3) governance structure, which explains the power relations that coordinate chain activities; and 4) institutional frameworks at the local, national, and international levels in which production and exchange activities are embedded.

(18) As with every environmental policy instrument it is applied to achieve certain objectives. The key objective of Type 1 eco-labelling schemes is to realise environmental gains related to products. The evidence available of the performance of many environmental policy instruments is incomplete and type 1 eco-labelling schemes are not an exception. In “**The Impact of Type I Ecolabelling Implications for achieving improvements in the environmental performance of laundry detergents and tissue products**”, Andreas Öman assesses the impact of type I eco-labelling schemes to improve the environmental performance of detergents and tissue paper products. The study is based on interviews conducted with industry representatives.. The studies results imply that eco-label criteria can be linked to changes in the manufacturing processes of tissue paper and laundry detergents. The study also finds that revision of standards stringency has the potential to further improve the environmental performance of these products however revision frequency has slowed in recent years.

(19) The paper “**Who wins from Fairtrade?**” by Mark Sanctuary presents an empirical welfare analysis of the Fairtrade Label. The study uses a panel of consumer data that follows the retail

⁶ Originally termed ‘global commodity chains’, the deliberate move towards ‘global value chains’ was made to draw attention to the uneven distribution of value along the chain, and to avoid confusion arising from the common misuse of the term commodity as a standardized good (Humphrey and Schmitz 2000).

consumption choices of coffee for 3000 households across Sweden. The results of the analysis suggest that; the Fairtrade price premium in 2008 on retail coffee in Sweden was 20%; consumer surplus is accrued to primarily young educated urban households with children; and that the pecuniary benefits of Fairtrade coffee are captured primarily by coffee retailers and wholesalers. Coffee growers in developing countries appear to receive a relatively small share of the price premium on Fairtrade labelled coffee.

(20) **International Commodity Agreements as vehicles for Environmental Standards** (Jason Potts – to come)

Communication

Our communications activities have sought to connect applied academic research and policymaking. Towards this, ENTWINED's research agenda developed from the beginning with the ambition of tackling pressing and topical issues that confront policymakers. This is reflected in not only the type of studies we have delivered, but also in the events and activities we engage in and support. Our publications, presentations and summaries of our events are available on our website: www.entwined.se.

Outputs for both academics and practitioners

ENTWINED has begun to realise the benefits of our approach to bridging the divide between research and practice. From the beginning of the programme, the research team had worked to identify issues that not only make good research but are also important for policymaking. This was in fact our first step in establishing the programme's key messages. Our work so far has provided us with a solid footing for moving ahead with our next step, which will see a shift in emphasis towards dialogue and communicating and supporting the implementation of our results. ENTWINED has been successful in terms of the volume and the quality of output. But a special requirement imposed on all Mistra programmes, is to maintain a balance between the contribution to academia and to practice. The ENTWINED programme has therefore been designed to produce both academic research of very high international quality, and studies that are accessible to practitioners. Because of this, we have successfully maintained a balance between the two groups of users of output from the programme. Roughly half of the writings in the programme have been targeted for purely academic audiences, and half for a wider readership. For example, some of our studies targeted for a scientific readership are:

- *“Comparing Policies to Combat Emissions Leakage: Border Tax Adjustments versus Rebates”* (Fischer and Fox)
- *“GMO food in the European Union: Are policies likely to be protectionist?”* (Eggert and Greaker)
- *“Effects of global fisheries on developing countries – possibilities for income and threat of depletion”* (Eggert and Greaker)
- *“On Biofuels and Trade”* (Eggert and Greaker)
- *“Have Countries with Lax Environmental Regulations a Comparative Advantage in Polluting Industries?”* (Quiroga, Persson, and Sterner)
- *“The Burden of Proof in Environmental Disputes in the WTO: Economic Aspects”* (Horn)
- *“Competing Environmental Labels”* (Fischer and Lyon)

In contrast, the following studies are largely accessible to practitioners (which is not to say that they do not also have academic aims and qualities):

- *“The Permissible Reach of National Environmental Policies”* (Horn and Mavroidis)
- *“Does trade help or hinder the conservation of natural resources?”* (Fischer)
- *“The Burden of Proof in Environmental Disputes in the WTO: Legal Aspects”* (Horn and Mavroidis)
- *“The Legality of Process and Production Methods under the GATT”* (Potts).
- *“Voluntary Standards and Agricultural Markets”* (Potts)
- *“Border Tax Adjustments”* (Cosbey)
- *“A Sustainable Development Roadmap for the WTO”* (Cosbey)
- *“Voluntary Sustainability Standards and Economic Rents: The economic impacts of voluntary sustainability standards in the coffee, fisheries, and forestry sectors”* (Potts)
- *“The Impact of Type I Ecolabelling Schemes to Improve the Environmental Performance of Products”* (Öman)

- The book “*Fisberies, Sustainability and Development*”, including a chapter by Eggert and Greker, was published in October, 2009.⁷

In terms of the studies produced to date, the programme has been evenly balanced between work written for an academic community, and work written for a wider audience.

Seminars, workshops and conferences

In addition to conducting research, ENTWINED has participated in a series of outreach activities. Some of these have involved presentation of research targeting academics in seminars, workshops and conferences, other presentations have targeted a broader group of stakeholders. Presentation material and summaries of these events are available online at www.entwined.se. The following is an incomplete listing of presentations:

- The study “*Competing Environmental Labels*” by Carolyn Fischer and coauthor Tom Lyon was presented at the U.S. Environmental Protection Agency National Center for Environmental Research Workshop on Environmental Behavior and Decision-Making: Corporate Environmental Behavior, New York, January 2008; at the Montreal Natural Resources and Environmental Economics Workshop, Montreal, QC, February 2008; and at the EAERE annual meeting, Gothenburg, June 2008.
- The study “*GMO food in the European Union: Are policies likely to be protectionist?*”, coauthored by Håkan Eggert and Mads Greker, was presented at the European Association of Environmental and Resource Economists (EAERE) conference in Gothenburg , June 2008.
- The study “*Have Countries with Lax Environmental Regulations a Comparative Advantage in Polluting Industries?*” by Miguel Quiroga, Martin Persson and Thomas Sterner, was presented at the EAERE conference in Gothenburg, June 2008.
- Petros C. Mavroidis presented “*Border Tax Adjustment: What is at Stake?*” at the ENTWINED Policy Dialogue at the EAERE meeting, Gotheburg, June 2008.
- The study “*The Permissible Reach of National Environmental Policies*”, coauthored by Henrik Horn and Petros C. Mavroidis, was presented at the EAERE conference in Gothenburg in

• ⁷ The Royal Swedish Academy of Agriculture and Forestry (KSLA), Stockholm, 2009.

June 2008, and the International Economic Institutions Workshop hosted by the Seoul National University in September 2008; International Economic Institutions workshop in Seoul, September 2008.

- The study “*Comparing Policies to Combat Emissions Leakage*” by Carolyn Fischer and coauthor Alan Fox was presented at the International Energy Agency expert meeting “Issues behind Competitiveness and Carbon Leakage,” Paris, May 2008; at the EAERE annual meeting, Gothenburg, June 2008; at the Canadian Economics Association conference, Vancouver, BC, June 2008; at the WTO Public Forum, ENTWINED Programme session, Geneva, September 2008; at the École Polytechnique Laboratoire d’Econométrie Workshop “The EU climate policy and border adjustment” in Paris, September 2008; and at the Economics seminar, la Sorbonne, Paris, September 2008; and as a keynote address at “Conference on the International Dimensions of Climate Policies,” University of Bern, Switzerland, January 2009; at the National Tax Association meetings, Denver, CO, November 2009 and at an ICTSD side event during COP_15, Copenhagen, December 2009.
- “*Committee on Sustainability Assessment test results on the sustainability impacts of sustainability standards in the coffee sector*” by Jason Potts (2008) Council of the International Coffee Organization in London, September 2008.
- The literature review “*What can ecolabelling do for the climate? Consumer perspectives*” was presented at the dialogue on “Trade and Climate Change: Key Issues for LDCs, SVEs, and SIDS from a Competitiveness, Adaptation and Resilience Perspective”. International Centre for Trade and Sustainable Development in Geneva, November 2008.
- Jason Potts participated as an expert at a workshop on impact assessment methodologies for standards hosted by the Trade Standards Practitioners Network meeting in Berlin, December 2008.
- The study “*On blending mandates, border tax adjustment, and import standards for biofuels*”, coauthored by Håkan Eggert and Mads Greker, was presented at the meeting Washington Dialogue Series, Trade and Climate Change: Development Aspects of Climate Change Policies of OECD Countries, Washington DC, 5 May 2009.
- The study “*On blending mandates, border tax adjustment, and import standards for biofuels*”, coauthored by Håkan Eggert and Mads Greker, was presented at the European Association of Environmental and Resource Economists (EAERE) conference in Amsterdam, June 2009.

- Jason Potts participated in Jakarta "Business and Biodiversity" Conference in Jakarta, October, 2009 to present metrics of measuring trade and biodiversity.
- Jason Potts organized a joint session on "*A Sustainable Development Roadmap for the WTO*" in conjunction with the WTO at WTO Secretariat, November 2009.
- At the CESifo Area Conference on Energy & Climate Economics, Munich, October 16, 2009, Carolyn Fischer presented "*Combining Rebates with Carbon Taxes: Optimal Strategies for Coping with Emissions Leakage and Tax Interactions*".
- Carolyn Fischer presented "*When Revenue Recycling Isn't Enough: Permit Allocation Strategies to Minimize Emissions Leakage*" at the University of Ottawa, November 2009.
- The policy brief by Fischer and R. Morgenstern "*US Industry and Cap-and-Trade: Designing Provisions to Maintain Domestic Competitiveness and Mitigate Emissions Leakage. Energy Security Initiative Policy Brief 09-06. Washington, DC: the Brookings Institution*", was presented at Brookings event, November, 2009, Washington, DC.
- During COP-15 Copenhagen, Denmark, December 2009, Carolyn Fischer discussed current work and research priorities at "The Low-Carbon Economy Beyond Copenhagen: The Global Law & Policy Research Agenda" An International Policy Research Seminar at the UNFCCC COP 15, sponsored by a consortium of universities.

Co-hosted events

ENTWINED has also financially supported and/or co-organized a series of events seeking to encourage closer dialogue between academics and practitioners. To date ENTWINED researchers have brought their own work together, as well as bringing policy makers and scientific researchers together through a series of targeted policy workshops. Each of ENTWINED's activities have walked the line between academic, science-based research and practitioners. Presentation material and summaries of these events are available online at www.entwined.se.

- A policy dialogue on "Border Carbon Adjustments" in June at the European Association of Environmental and Resource Economists (EAERE) 2008 conference. The exploratory Discussions on Border Tax Adjustments and the Climate Regime targeted a broader audience.
- A panel presentation on Leveraging Trade Policy toward Sound Environmental Governance: Legal and Economic Considerations Related to the Implementation of

Market-Based Environmental Policies at the WTO Public Forum in the fall of 2008. This session set out to explore the interaction between market-based environmental policies, international trade, and international trade law. It drew from examples related to the management of greenhouse gas emissions in the US and China, including the proposed use of border adjustments. The expert panelists brought to the table the different perspectives of economic instrument design, legal interpretation, developing country contexts, and global governance. A broad-based discussion of the issues and other applications followed the presentations; and

- A conference with the International Social and Environmental Accreditation and Labelling Alliance (ISEAL) and the World Bank on Government Use of Voluntary Standards also in the fall of 2008. Around the world, a growing number of governments use voluntary standards to deliver on their own public policy objectives. This two day high-level conference, one of the first major international events linking private voluntary standards to public governance - served as a space for governmental bodies and voluntary standards initiatives to discuss these practices, and start to identify how to work together more effectively.
- A conference with Geneva based International Centre for Trade and Sustainable Development and the Washington based ENTWINED partner Resources for the Future ⁸. The dialogue took place in May 2009 and focussed on trade and climate and the development aspects of climate change policies of OECD countries. Thru this initiative, ICTSD and ENTWINED: (i) explored the development aspects of selected OECD countries' domestic trade policies intended to address climate change, and (ii) provided a platform for interaction and exchange amongst trade negotiators/policy-makers, private sector representatives, academia and civil society from both OECD as well as developing countries.
- A seminar on Trade and Climate with Sweden's National Board of Trade in September 2009. The seminar brought together leading academics, decisionmakers and practitioners to present and discuss, in an informal setting, some of the pressing challenges we face on international trade and the environment. These issues underline a basic potential conflict

⁸ The agenda is available online at: <http://www.rff.org/Events/Pages/Development-Aspects-of-Climate-Change-Policies-of-OECD-Countries.aspx>

between the WTO's purpose of constraining unilateral policy-making and the calls for more active unilateral and multilateral environmental policies. This potential conflict may become real if proposals for border adjustments for the environment are implemented. For one, WTO members are not free to select unilateral policies to target perceived deficiencies in other countries' environmental policies. In particular, members still have to respect the non-discrimination obligations in the form of the Most-Favoured Nation clause, and the National Treatment clause. These issues were be discussed and explored during the workshop.

- A book launch at the WTO "A Sustainable Development Roadmap for the WTO" in November 2009. The roadmap calls for the WTO to rethink its direction and goals, and then redesign a trade policy that meets the imperatives of environmental protection and the needs of impoverished and vulnerable sectors of society. The launch was attended by several high level delegates including the Director General of the WTO, Pascal Lamy, as well as ambassadors to the WTO, among several other important stakeholders.

ENTWINED researchers have actively engaged in the trade and environment debate by participating in a range of outreach activities, and a significant proportion of these have targeted practitioners and policy makers. In this way the ENTWINED researchers are working to bridge the gap between research and practice.

Teaching and graduate supervision

ENTWINED's partners include the Ecological Economics Unit of University of Gothenburg and the Department of Economics at Stockholm University. Trade and environment teaching and supervision has gained momentum partly through the participation of these institutes in this programme.

For example Handelshögskolan, University of Gothenburg has decided to continue with a Master course on Environmental Economics - International Issues. The overall objective of the course is to give students comprehensive knowledge of economic theory applied to environmental problems with an international dimension. Examples of such are Regional and Global Environmental Problems, International Trade and the Environment, Foreign Direct Investments and the Environment, The International Allocation of Wealth and the Environment, International Natural Resource use and Globalization and the Political Economy of the Environment.

Mistra is also funding a PhD student through ENTWINED at the Department of Economics at Stockholm University. The PhD Programme consists of four years of full-time study, commencing

in September 2008. Alexander Schmitt was awarded this opportunity. The PhD programme being followed begins with two years of course work, from there Alexander will begin conducting his own research that will include Trade and Environment issues, and the plan is to ensure that this is integrated with ENTWINED's activities. Currently, the PhD student is focusing on his courses, but also attending ENTWINED events where appropriate. In addition to the regular PhD Programme of study, the candidate may also include a one year internship at the Swedish Ministry for Foreign Affairs.

The ENTWINED Team

Researchers

The research consortium brings together researchers from different disciplinary backgrounds, including international law, economics, policy, and natural science. They are an international group comprised of leading trade and environmental policy researchers based mainly in Sweden, but also from Switzerland, Canada, and the United States. The following people, listed in alphabetical order, has formed the research team of Phase 1:

Håkan Eggert is Researcher in Economics at Göteborg University, Sweden. He earned his Ph.D. in Economics in 2001 with a thesis on problems related to commercial fisheries. The thesis work was part of the Mistra-funded program Sustainable Coastal Zone Management. Håkan Eggert has been actively involved in developing an Environmental Social Science Masters Program at Göteborg University and has served as Director of Studies and Chairman for this Program. He has published papers on bioeconomics, risk, production, compliance and valuation, usually with a link to marine resources. He has also served as an advisor to the Swedish Environmental Protection Agency, for the Commission on the Marine Environment appointed by the Swedish government and the public report *Fishy Fishing: Decision-Making and Economic Performance in Swedish Fishery Policy*, appointed by the Ministry of Finance.

Carolyn Fischer is a tenured Fellow at Resources for the Future (RFF) in Washington, DC. She holds a Ph.D. in Economics from the University of Michigan, Ann Arbor, and a B.A. in International Relations with honours from the University of Pennsylvania in Philadelphia, USA. Her research interests cover a variety of issues, both domestic and international, from resource use and decision making over time, to environmental and tax policy design, to behavioral economics. Specific to this project, she has written on the implications of multilateral trade agreements for the design and implementation of domestic environmental policies. She has also studied voluntary environmental policy mechanisms like ecolabels, the relationship between trade and invasive species management,

and the role of trade in protecting endangered species. She has published widely in peer-reviewed journals and has also conducted policy analysis for the World Bank Group, the Asian Development Bank, and the Canadian National Round Table on the Environment and the Economy. Prior to RFF, she served as a Staff Economist at the Council of Economic Advisors to the President during the Clinton Administration. She spent the fall of 2005 as a Fellow at the Norwegian Centre for Advanced Study, conducting research on climate and technology policies with Thomas Sterner. She frequently travels to Göteborg to collaborate on research and advise students.

Mads Greaker is affiliated with the Department of Economics, Göteborg University, in a part-time capacity. Among other responsibilities, he coordinates together with Håkan Eggert the Master Course “Environmental Economics—International Issues,” in which trade and the environment constitutes a major part. Mads Greaker earned his Ph.D. in Economics from the University of Oslo in 2002. His thesis was on the relationship between industrial organisation, international competitiveness, and environmental regulations. He has published several papers on various aspects of the Porter-hypothesis, on ecolabelling and protectionism, as well as on the economics of climate change. He is head of the research group for Petroleum and Environmental Economics at Statistics Norway in Oslo.

Mark Halle is the director of the Institute for Sustainable Development’s (IISD’s) office in Europe, and also of its global programme on Trade and Investment. A joint citizen of the United States and Italy, he spent the bulk of his career in international environmental affairs. He began as a Programme Officer in the Policy Planning Unit of the United Nations Environment Programme, moving to the World Wildlife Fund International, responsible for its programme in China. He then helped to establish the Conservation for Development Centre in IUCN—the World Conservation Union, moving on to become, successively, the Director of Field Operations, the Director of Development, and finally the Director for Global Policy and Partnerships in IUCN. He left IUCN in 1997 to set up the IISD Office in Europe. He is also the founder and first Chairman of the International Centre for Trade and Sustainable Development, and sits on a wide range of boards and advisory committees for trade-related organisations in Europe, Asia, Latin America and Australia. He frequently lectures and publishes on trade, investment and environmental issues.

Henrik Horn, Professor of International Economics, joined the Institute for International Economic Studies (IIES), Stockholm University in 1978. He became Doctor of Economics at Stockholm School of Economics 1983, Associate Professor at the IIES 1986, and was Full Professor at the IIES from 1994 until his resignation 2007. He was Deputy Director at the IIES between 2000 and 2004. Since 2006 his main affiliation with the Research Institute of Industrial Economics (IFN, formerly IUI) in Stockholm, where he is Senior Research Fellow. Horn is also Non-Resident Senior Fellow at Bruegel, a Brussels-based think tank, Chief Reporter (jointly with

Petros C. Mavroidis) for the American Law Institute project Principles of World Trade Law: The World Trade Organization. Horn is Research Fellow in the International Trade and Industrial Organization Programmes of the Centre for Economic Policy Research, London, and an Editorial Board member of the World Trade Review. Horn has done research in a variety of areas, including International Economics, Industrial Organization, Labor Economics and Economics of Sports. Since approximately 10 years, Horn research mainly focuses on issues at the intersection between Economics and Law, and in particular economic and legal aspects of international integration agreements, such as the WTO and the EU, and competition and regulation issues. He is also participating with Petros C. Mavroidis in a long-term project on the relation between nationally and multilaterally defined environmental policies and the WTO Agreement. Horn has taught from introductory courses to advanced graduate courses at e.g. Stockholm University, Stockholm School of Economics, the University of Michigan, Princeton University, the World Trade Institute (Bern), and the Graduate Institute of International Studies (Geneva). He has served as a Judge in the Swedish Supreme Court for antitrust cases, and worked for four years in the Economic Research and Analysis Division of the WTO.

Lars-Gunnar Lindfors, M.Sc Chem Eng, Scientific Director at IVL Swedish Environmental Research Institute is also the head of the Institute's LCA group. Mr. Lindfors has been involved in the international LCA work since 1991 when he joined the SETAC-Europe LCA Steering Committee. He served as Vice-Chairman of that Committee 1995-1996. He is an appointed Swedish expert to ISO (TC 207/SC5/WG1 and TC 207/SC3/WG1/TG). He was the scientific manager of the project "LCA Nordic" commissioned by the Nordic Council of Ministers and is the main author of "Nordic Guidelines on Life-Cycle Assessment, Nord 1995:20" and "A manual for the calculation of ecoprofiles intended for third party certified product performance declarations, IVL Swedish Environmental Research Institute, February 1998". He has authored or co-authored more than 20 papers or publications on LCA methodology since 1990, been involved in several LCA studies for private and public clients and has conducted more than 30 critical reviews of LCA studies.

Petros C. Mavroidis is Edwin B. Parker Professor of Law at Columbia Law School, New York, and Professor of Law at the University of Neuchâtel, Switzerland, as well as a Research Fellow at CEPR. He studied in Brussels and Berkeley before completing his Ph.D. thesis in Heidelberg, Germany. He has taught Competition Law, Trade Law, and Public International Law at various institutions, including European University Institute (Florence) and Princeton University. Mavroidis was with the Legal Service of the GATT/WTO 1992–1996, and has also worked for the OECD Trade and Competition Directorate. He has consulted for the European Commission, and the World Bank. His core interests are in the study of international trade, and he has published extensively in the area. He is, along with Henrik Horn, Chief Reporter for the American Law

Institute (ALI) for the same long-term project described above. His current research has in particular focused on dispute settlement in the WTO. He recently prepared with Horn a comprehensive data set on the WTO dispute settlement system available at www.worldbank.org/trade/wtodisputes. Another focus of his current research is the design of the WTO mandate, with special emphasis on the interplay between trade and social preferences.

Jason Potts is the coordinator of the Sustainable Commodity Initiative—a joint initiative of the United Nations Conference on Trade and Development (UNCTAD) and IISD. He is a lawyer by training with expertise in international trade law, sustainable development law and corporate social responsibility. Prior to coming to IISD, Mr. Potts worked at the International Development Research Centre, Canada where he conducted research on sustainability in the coffee sector. He has also worked with the Commission for Environmental Cooperation, the environmental side-body to the North American Free Trade Agreement, on the analysis and development of markets for sustainable coffee in the North American context.

Mark Sanctuary, is a Senior Researcher and Project Manager at IVL Swedish Environmental Research Institute. His work currently includes research on international economics and the management and execution of projects in Asia and Eastern Europe. Apart from his activities with ENTWINED, Mark managed and led a major EU project on the Clean Development Mechanism in China in cooperation with key Chinese authorities and is also pursuing a PhD at Stockholm University's Department of Economics. Prior to beginning at IVL Swedish Environmental Research Institute in 2005, he worked at the United Nations Environment Programme's Economics and Trade Branch in Geneva. In this capacity, he managed, co-ordinated and facilitated a range of international environmental projects in co-operation with multilateral organisations such as the OECD and the World Bank.

Thomas Sterner is Professor of Environmental Economics at the University of Göteborg, Sweden and a University Fellow at Resources for the Future, Washington DC. He earned his Ph.D. in Economics in 1986 with a thesis on energy demand in Mexican industry. He became an Associate Professor in 1989 and a Full Professor of Environmental Economics 1995. He directs the Environmental Economics Unit (EEU), which currently has a dozen Ph.D. students and about 20 graduate students from all over the world. During the last decade and a half, the EEU has examined about two dozen Ph.D. students. Sterner has published over 55 articles and books. Among these are several books with RFF Press, Kluwer, and others on the design of policy instruments. One of his most popular books is *Policy Instruments for Environmental and Natural Resource Management* from RFF Press and the World Bank. He was recently elected President of the European Association of Environmental and Resource Economists for the period 2007–8.

Programme Board

ENTWINED follows Mistra's guidelines for the organisation and management of the programme and one of the important features of all Mistra research programmes is the appointment of a Programme Board, by Mistra and IVL Swedish Environmental Research Institute. Through regular meetings with the research team, the Programme Board helps manage ENTWINED. This body is entrusted with overall responsibility for the direction, quality and finances of the programme. ENTWINED's board consists of:

Lars Anell was born in 1941 in the town of Katrineholm, Sweden, and graduated in 1966 from Stockholm School of Economics and the University of Stockholm. He spent four years with the Ministry of Finance before he joined the Ministry for Foreign Affairs in 1970. From 1986 to 1992 he served as Ambassador in Geneva, during which period he chaired GATT's Council and Contracting Parties. In 1992 he was appointed Ambassador to the European Union when Sweden started its accession negotiations. In 1994 he left public service and joined the executive team to AB Volvo, from which company he retired in 2001. Lars Anell serves as chairman of several organizations, including the Stockholm Environment Institute and ICC's Commission on Trade and Investment Policy. He has published several books and articles in the field of economics and political science.

Lena Johansson is Director General at the National Board of Trade, since 2005. Her earlier positions have mainly been in ministries and governmental authorities, working on policies on agriculture, budget and EU matters. She has held positions as Director General at the Swedish Institute for Food and Agricultural Economics as well as Head of Unit at the Ministry of Finance and the Ministry of Agriculture. She serves on several boards including The Swedish International Development Cooperation Agency, The Swedish National Dept Office and The Swedish Industrial Design Foundation.

Karl-Göran Mäler is Professor in Economics at the Stockholm School of Economics and Director of the Beijer International Institute of Ecological Economics. His current research interests are Measurement of well being and Economics analysis of complex dynamic ecological systems. Together with Professor Partha Dasupta he was awarded the 2002 Environment Prize (see picture below). Professor Mäler is jointly responsible with the EEU for the joint EEU/Beijer PhD program in Environmental Economics financed by SIDA. Within this program Professor Mäler is teaching a graduate course in Welfare Economics. He also regularly serves as a thesis advisor for the graduate students.

Anders Rune Chief economist at the Association of Swedish Engineering Industries Managing Director Teknikföretagens Förlag AB (The Associations publishing Company) Rune has a LicEng, Institute of Technology at Linköping University and previously held positions as Managing Director at Finanstidningen and university lecturer in economics at the Institute of Technology at Linköping University. Rune is currently head of the Department of Economic analysis. The Department publishes on a regular basis a Business Activity survey covering different sectors of the industry as well as groups of subcontractors and an Engineering Economic Outlook report. The Department also covers more than 800 individual member companies profitability and economic performance on yearly basis. It may also be of interest to mention the publishing of a series of reports covering the different Engineering industry sectors in India and how production in Sweden is affected. Similar reports have been filed on China and Eastern Europe. Anders Rune is a well known analyst of the Swedish industry, often to be quoted in Swedish newspapers, radio and television.

The Swedish Ministry for Foreign Affairs has been represented by *Anders Wallberg* and *Catarina Hedlund*.

Financial Report

ENTWINED's first phase has a total budget of 15,7 MSEK allocated over three years across three major budget lines, namely; Research Effort, Communications and Engagement and Programme Management. At the end of our first three years of operation, spending across each of these budget lines is in line with our plan. According to our financial records, we have an outstanding balance of over 1.3 MSEK however most of this is due to the large exchange rate fluctuations over the three year period of 2007-2009. In fact the 806 KSEK balance under Research Effort is closer to zero [to be confirmed with auditor]. In addition, we have earmarked 350 KSEK for an OECD-ENTWINED Conference that is scheduled for June 2010 and finally, we have 150 KSEK balance from a 250 KSEK contingency. We will request to Mistra that any funds left over from Phase I be made available during Phase II.

Entwined program budget

SEK

Research Effort Category	Budgeted			Totalt	Expenses incurred			Balance 2009-52
	2006+2007	2 008	2 009		2006+2007	2008	2009	
Gross Salary excl. OH	2 979 420	2 891 509	2 833 191	8 704 121	1 894 369	3 397 981	3 018 015	393 755
University OH	1 311 139	1 272 452	1 246 788	3 830 379	480 254	1 211 020	867 738	1 271 366
Material, Equipment	0	0	0	0	6 652	2 568	4 923	-14 142
Travel	0	0	0	0	109 920	341 913	152 905	-604 738
Other Costs	0	0	0	0	39 049	166 322	34 761	-240 132
VAT	0	0	0	0	0	0	0	0
Unallocated	0	0	0	0	0	0	0	0
Sum	4 290 559	4 163 961	4 079 980	12 534 500	2 530 243	5 119 804	4 078 343	806 109

Communications and Engagement Category	Budgeted			Totalt	Expenses incurred			Balance 2009-52
	2006+2007	2 008	2 009		2006+2007	2008	2009	
Gross Salary excl. OH	115 000	115 000	115 000	345 000	66 210	133 600	16 716	128 474
University OH	0	0	0	0	0	0	15 654	-15 654
Material, Equipment	0	0	0	0	0	0	36 545	-36 545
Travel	35 000	30 000	35 000	100 000	11 748	36 206	170 937	-118 891
Other Costs	80 000	620 000	720 000	1 420 000	82 854	620 845	345 339	370 961
VAT	0	0	0	0	0	0	0	0
Unallocated	0	0	248 500	248 500	0	0	0	248 500
Sum	230 000	765 000	1 118 500	2 113 500	160 812	790 651	585 191	576 845

Program Management Category	Budgeted			Totalt	Expenses incurred			Balance 2009-52
	2006+2007	2 008	2 009		2006+2007	2008	2009	
Gross Salary excl. OH	205 532	102 766	102 766	411 064	227 599	165 068	127 490	-109 094
University OH	219 468	109 734	109 734	438 936	243 031	154 587	119 395	-78 076
Material, Equipment	15 000	15 000	15 000	45 000	3 512	0	0	41 488
Travel	25 000	25 000	30 000	80 000	15 217	0	1 811	62 973
Other Costs	25 000	25 000	27 000	77 000	18 916	13 771	15 150	29 164
VAT	0	0	0	0	0	0	0	0
Unallocated	0	0	0	0	0	0	0	0
Sum	490 000	277 500	284 500	1 052 000	508 275	333 426	263 846	-53 546

Total Category	Budgeted			Totalt	Expenses incurred			Balance 2009-52
	2006+2007	2 008	2 009		2006+2007	2008	2009	
Gross Salary excl. OH	3 299 952	3 109 275	3 050 957	9 460 184	2 188 178	3 696 650	3 162 221	413 136
University OH	1 530 607	1 382 186	1 356 523	4 269 316	723 285	1 365 607	1 002 787	1 177 636
Material, Equipment	15 000	15 000	15 000	45 000	10 164	2 568	41 468	-9 200
Travel	60 000	55 000	65 000	180 000	136 885	378 119	325 652	-660 656
Other Costs	105 000	645 000	747 000	1 497 000	140 819	800 938	395 251	159 993
VAT	0	0	0	0	0	0	0	0
Unallocated	0	0	248 500	248 500	0	0	0	248 500
Sum	5 010 559	5 206 461	5 482 980	15 700 000	3 199 330	6 243 881	4 927 380	1 329 409

About ENTWINED

The ENTWINED programme examines the interplay between the global trade regime and environmental policies promulgated by governments and private entities as well, with a particular focus on the treatment of transboundary problems. Taking both a positive and a normative point of view, the programme aims first to identify when these regimes act in concert or at cross purposes and second to suggest alternatives to allow for simultaneous achievement of environmental and trade objectives.

Mistra seeks to promote sustainable development by investing in collaboration between researchers and practitioners – with the aim of solving important environmental problems. More information on ENTWINED and Mistra is available online at www.entwined.se



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