

# Final Report

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## **Study of the Impacts of Green Trade Liberalisation on Least Developed Countries**

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The views expressed in this report are our personal views and do not necessarily reflect the position of the Ministry of Foreign Affairs of Denmark.

**ACRONYMS AND ABBREVIATIONS**

A4T	Aid for Trade
ACP	Africa, Caribbean, Pacific
APEC	Asia-Pacific Economic Cooperation
EBA	Everything But Arms
EGA	Environmental Goods Agreement
EPA	Economic Partnership Agreement
EPP	Environmentally Preferable Product
EU	European Union
GATT	General Agreement on Tariffs and Trade
GNI	Gross Domestic Income
HS	Harmonised System
ICTSD	International Centre for Trade and Sustainable Development
IMF	International Monetary Fund
ITA	Information Technology Agreement
LDC	Least Developed Country
MFN	Most Favoured Nation
NAMA	Non-Agricultural Market Access
NTM	Non-Tariff Measure
OECD	Organisation for Economic Co-operation and Development
SDT	Special and Differential Treatment
SPS	Sanitary and Phytosanitary
TBT	Technical Barriers to Trade
TRIPS	Trade-Related Intellectual Property Rights
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change
WITS	World Integrated Trade Solution
WTO	World Trade Organization

## SUMMARY

**17 WTO members negotiate the Environmental Goods Agreement (EGA) that aims to liberalise green trade in the form of tariff cuts on an list of environmental goods.** In this report commissioned by the Ministry of Foreign Affairs of Denmark, we ask what effects the EGA will have on LDCs, what are the LDCs offensive and defensive interests and which assistance will help LDCs adjust to a liberal green trade regime? The Ministry commissioned the report to implement Denmark's Action Plan for Policy Coherence for Development.

**We find that the EGA currently on the negotiation table will neither benefit nor harm LDCs.** They may be affected either when their export markets cut tariffs and opens their markets or when LDCs cut their own tariffs and gain access to cheaper technologies to combat their own environmental problems.

**LDCs exports will hardly be affected.** LDCs export only about \$1 billion of environmental goods (about half a per cent of their total exports) and only a third of this export is destined for countries negotiating the EGA. LDCs already access the markets of most EGA negotiating countries tariff free due to preferential trading arrangements. The environmental goods to be liberalised are too high tech to be produced by LDCs either as finished products or as components.

**In most LDCs, the EGA will not provide better access to green technologies.** If LDCs join the EGA, tariffs will in most cases not fall much because the average tariff is a moderate 8.6%. For some industries in some LDCs, cutting tariffs may increase imports because tariff peaks reach up to 40%. Eleven LDCs have average tariffs above 10%. But even here, other factors than the price of technology constrain its transfer. In Myanmar, we found that adverse government policy and low private investment constrain renewable energy technology transfer.

**But the EGA might evolve over time and if it does, it may become more relevant to the LDCs.** LDCs export many products that some observers claim are environmentally friendly like cotton (view as greener than synthetic fibres). The inclusion of many such products is, however, politically very difficult. More

politically feasible it is to include the regulation of non-tariff barriers if the EGA is changed in the future. LDCs may want to join the EGA if it becomes a forum for regulating standards and sustainability criteria.

## **1. Introduction**

**Today, technology can address global and local environmental problems but we do not always allow it.** Much energy production, for example, is still based on coal, while renewable energy technologies offer cleaner solutions. Governments impose tariffs on the import of environmental goods embodying such clean technologies, thus preventing technologies to flow freely from where they have been invented to where they are needed.

**The negotiations on a future Environmental Goods Agreement (EGA) seek to remove this man-made obstacle.** 17 WTO members currently seek a green liberalisation by establishing a plurilateral trade agreement nested within the WTO that would as a first step remove tariffs on environmental goods. The target is to produce an agreement by the end of 2015 that likely will include immediate green trade liberalisation in the form of tariff removal on an agreed list of environmental goods and a plan for longer term liberalisation consisting in the inclusion of more environmental goods and potentially even services and the removal of non-tariff barriers.

**17 high and middle income WTO members (including the European Union (EU) as one member) are negotiating the EGA.** While any WTO member is invited to join the negotiations, no Least Developed Country (LDC) member has so far chosen to do so.

**The report was commissioned by the Trade Policy Department under the Ministry of Foreign Affairs of Denmark.** The report is part of the implementation of Denmark's Action Plan for Policy Coherence for Development that establishes the interests of LDCs in international trade negotiations as a Danish priority.

### *Purpose*

**The purpose of this report is to analyse the impacts on LDCs of the EGA.** Denmark is one of the WTO members negotiating the EGA through its

membership of the EU. The basis for the report is the terms of reference issued by the Ministry of Foreign Affairs of Denmark, the project proposal agreed between the Ministry of Foreign Affairs of Denmark and the authors and the Inception Report submitted to the Ministry on 3 April 2015.

**The report seeks to answer to the following research questions:**

- What effects will the EGA have on LDCs?
- What are the concerns, interests and sensitivities of LDCs in green liberalisation including offensive and defensive interests?
- What types of assistance will ease the transition and adaption to a liberalisation of green trade to LDCs?
- Which measures can alleviate negative effects on LDCs?

Three policy agendas intersect in the EGA: environmental policy, trade policy and development policy. To avoid that the pursuit of several policies simultaneously result in contradicting policies, Denmark has adopted an Action Plan for Policy Coherence for Development (Ministry of Foreign Affairs 2014). This report is part of the implementation of the action plan. Answering the research questions will allow us to say whether Denmark's development policy in the form of safeguarding LDC interests are aligned with Denmark's environmental and trade policies in the form of concluding the EGA.

#### *Research methodology and limitations*

**We have reviewed the large academic and policy literature on green trade liberalisation including both formally published literature and grey literature like WTO documents from the Committee on Trade and Environment.** The existing literature is quite large, although often repetitive with many newer studies referencing older ones. Most studies are overview studies, while more academic studies like modelling analyses and in-depth case studies are rare.

**Furthermore, we have analysed available data on trade flows and tariffs.** The most widely used source of trade flow data is the Comtrade database from the

United Nations Statistics Division that collects data on imports and exports from all member countries' national statistical agencies. Comtrade data presents two specific challenges: First, not all member countries and in particular not LDCs report trade statistics on a yearly basis, thus leaving significant gaps in the data material. For instance, Myanmar has not reported data on trade flows since 2010. And second, when both countries in a bilateral trade flow have reported import and export figures, they do not always match. Myanmar's reported exports of timber to Thailand may not correspond to Thailand's reported imports from Myanmar. To address these issues, we use balanced data from the BACI database (Gaulier and Zignago 2010), prepared by CEPII. The BACI database is derived from Comtrade data, where the holes left by incomplete reporting are (partly) filled by the mirrored data and where discrepancies between import and export number have been reconciled through advanced statistical methods.

**Data on applied tariffs matching the trade flow data are obtained through the World Integrated Trade Solutions (WITS) portal developed by the World Bank.** The tariff database specifies a bilateral tariff structure including both Most-Favoured Nations (MFN) tariffs and preferential tariff rates applied in regional trade agreements and preferential market access regimes.

**In the statistical analysis, we exclude intra-EU trade because the EU negotiates as one entity and intra-EU trade is already duty-free.** Adding intra-EU trade would artificially inflate the potential impact of the EGA.

**Interviews conducted in Geneva and Myanmar complement the literature review and descriptive data analysis.** In Geneva, we interviewed trade negotiators from LDCs and other developing countries and from research and policy institutions about the status of the negotiations. We also conducted a case study of Myanmar focusing on renewable energy; a topic of particularly high relevance to the country, because Myanmar has one of the world's lowest electrification rates leaving most rural households completely without electricity. Myanmar is a large LDC located in fast growing South East Asia and we hoped that the country's size and location would allow us to study some of the impacts

of the EGA already identified at a general level in more depth. This case study was based on stakeholder interviews, literature and descriptive data analysis.

### *Outline of the report*

**The report is organized in five chapters including the present introduction.**

Chapter two provides the background for the EGA negotiations and for studying the interests of LDCs in green trade and green trade liberalisations. Chapter three identifies the impacts of a future EGA on LDCs and discusses each one based on available literature and the descriptive analysis of trade flow and tariff data. Chapter four studies the case of Myanmar, focusing on four of the impacts already identified in chapter three. Chapter five concludes and provides policy recommendations.

## **2. Background**

### *2.1 The EGA negotiations*

**Negotiations on green liberalisation are part of the Doha Round.** Paragraph 31(iii) of the Doha Ministerial Declaration mandates the WTO members to negotiate the reduction or elimination of tariff and non-tariff barriers to environmental goods and services.

**The negotiations soon faced very severe political and practical difficulties.** Members could not agree to prioritize green liberalisation and at a practical level, they could not agree which goods and services to focus on and which trade barriers to remove. When the plurilateral EGA negotiations started in July 2014, green liberalisation had not advanced in the WTO for years.

**In 2012, the Asia-Pacific Economic Cooperation (APEC) agreed to liberalise the trade of 54 environmental products.** The heads of state of the 21 APEC members met in Vladivostok and agreed to lower tariffs on the 54 goods to maximum 5% by the end of 2015. Then, on 8 July 2014, 14 WTO members (counting the EU as one) launched plurilateral negotiations on the EGA. The EGA would use the APEC list of environmental goods as the starting point and focus on tariffs on goods while leaving services and non-tariff barriers to later. Since then another three countries have joined the EGA negotiations.

**The plurilateral EGA is nested under the WTO and WTO members may join the EGA negotiations at any stage.** Trade benefits offered by a future EGA will be extended to all WTO members following the Most Favoured Nation (MFN) principle. Thus all WTO LDC members will enjoy increased market access for environmental goods.

**So far, the plurilateral group - which have grown to comprise 17 countries - have held ten technical working group meetings.** During these technical meetings, the group has discussed ten different categories of environmental goods, as illustrated in table 1.

**Table 1. Past and future rounds of EPA negotiations**

Date	Topic	Participants
9-10 July	Framework and structure of the negotiations	Australia, Canada, China, Costa Rica, EU, Hong Kong, Japan, Korea, New Zealand, Norway, Singapore, Switzerland, Taiwan, and US
22-26 September	Ten categories of environmental goods for discussion agreed: 1. Air pollution control 2. Solid and hazardous waste management	<i>ibid</i>
2-5 December	3. Wastewater management and water treatment 4. Environmental remediation and clean-up 5. Noise and vibration abatement	<i>ibid</i>
26-30 January	6. Cleaner and renewable energy 7. Energy efficiency	+ Israel
16-20 March	8. Environmental monitoring, analysis and assessment 9. Environmentally-preferable products (EPPs) 10. Resource efficiency	+ Turkey and Iceland
4-8 May	Start of second phase: discussion of “wish list” of environmental goods	
15-19 June	Continuation of second phase	
27-31 July	Continuation of second phase	
16-22 September	Continuation of second phase	
29 October-4 November	Continuation of second phase	
30 November-4 December	Future round	

**During the first six rounds, the EGA negotiators discussed ten different types of environmental goods and each country suggested goods for consideration as environmental goods.** The negotiators discussed the various goods on a case-by-case basis without attempting to define narrowly an environmental good. This series of technical working group meetings ended in March. In April and May, each negotiating country submitted a list of nominated products building on their more indicative product proposals made during the previous technical

meetings. The individual lists of nominated products were subsequently combined to a “wish list” of environmental goods containing about 650 goods. In mid-August the chair of the EGA negotiations narrowed the wish list to 450 goods based on individual goods’ support during the negotiations and environmental credibility (ICTSD 2015a).

**To agree on the EGA, negotiators need to narrow the list further and to establish the modalities for the final agreement.** Likely, many goods have to be precisely defined within international customs codes. The EGA will also include a review mechanism allowing for products to be taken off the list and other products to be added foreseeing that technologies will change over time. The group of negotiation countries has informally set the WTO Ministerial Conference in Nairobi in December 2015 as the deadline for a final agreement.

## ***2.2 Identifying environmental goods***

### *2.2.1 What is an environmental good?*

**The lack of a clear definition of an environmental good challenges the negotiations.** These challenges are related to dual-use products, Environmentally Preferably Products (EPPs) and ex-outs (Sugathan 2009).

**Many environmental goods are dual-use products that have both environmental and non-environmental uses.** For instance, batteries may be used to store wind- or solar generated power, but they are equally suitable for storing fossil fuel generated electricity. A customs officer has little chance to determine the end use of imports when applying duties. The number of core environmental goods with clear environmental benefits that few would dispute – like solar panels, wind turbines and air purifying filters – is limited.

**EPPs are products that possess certain environmental qualities relative to a substitute product.** Examples include sacks and packaging materials made from jute and other plant fibres, which may substitute plastic bags, or biodiesel replacing fossil fuels. Including EPPs in the negotiations is difficult. The

environmental benefits of many EPPs relate to the production process as exemplified by biodiesel. Biodiesel saves CO<sub>2</sub> if its production emits less CO<sub>2</sub> than the fossil fuel it replaces. The CO<sub>2</sub> emitted by biodiesel varies. An extreme example is if biodiesel is produced from palm oil farmed on plantations that cleared virgin rain forest. The clearing of the forest may have emitted more CO<sub>2</sub> than what is saved by burning biodiesel instead of fossil fuel. Therefore, several negotiating parties including the EU want to use sustainability criteria to identify EPPs. EPPs will have to be certified that they comply with sustainability criteria, but certification schemes may be costly to set up and may become non-tariff barriers to trade.

**EGA negotiators discuss using ex-outs to precisely define environmental goods.** In the language of the negotiators ex-outs are goods defined at a more detailed level than what is allowed by the Harmonized Systems (HS) nomenclature created by the World Customs Organization. The HS assigns each product category with a numerical code; the more digits, the more disaggregated the product category is. The HS-codes are standardized worldwide down to the 6-digit level (yielding more than 5000 categories), but below this, each country uses its own system to add digits to create more finely disaggregated categories.

**In the HS most environmental goods are grouped together with non-environmental products.** For example, the product category “901380: LCDs not constituting articles provided for in other headings” contains “heliostats” (a mirror that concentrates the sun and used to produce solar energy), but most of the trade in this category is LCD flat screen TVs (Vossenaar 2014). The lack of detail in the HS presents negotiators with a dilemma: Should the EGA include the whole HS6 product category, thereby liberalizing many non-environmental goods alongside the targeted environmental ones, or should the EGA use ex-outs to focus on the environmental goods, thereby having to agree on their classification internationally below the HS6 level? Using ex-outs allows negotiators to identify environmental goods more accurately than the HS6 tariff

schedule allows, but it also produces a much more complex agreement, which may be more difficult to implement, not least for developing countries.

**Most nominated products are sophisticated technologies and products, like wind mills and solar panels or components thereof.** This choice of environmental goods is both result of the nature of the negotiating members involved and of the nature of environmental goods considered. The participating members are high income and a few middle income countries primarily interested in sophisticated environmental goods.

**Observers have asked themselves whether this focus on sophisticated environmental goods and the reluctance of LDCs to participate in green liberalisation – under the newly started plurilateral negotiations, in the WTO or elsewhere – is a true reflection of LDCs’ interests.** UNCTAD (1995) and Hamwey (2005), for instance, have argued that developing countries including LDCs have export interests in environmentally preferable products, which have played only a minor role in the plurilateral negotiations. Furthermore, while LDCs do not produce sophisticated environmental goods, they need such goods to combat their own domestic environmental problems.

### *2.2.2 Lists of environmental goods*

**At the time of writing (September 2015), the list of environmental goods on the table in the EGA negotiations is confidential and we have not had access to it.** However, we have a good indication of what will form the core of a future EGA from a variety of lists proposed during earlier negotiations under the WTO and from lists developed by researchers engaged in the green liberalisation debate. Table 2 presents an overview of the different lists and the number of HS6 categories proposed by the lists.

**The individual lists overlap partly or completely.** The most obvious environmental goods, such as 841919 (solar water heaters), are represented on all lists, and in some cases the same product category is on several lists but used as the basis for different ex-outs. Accounting for the overlaps, a gross list of all

environmental goods identified in the lists comprises 575 HS6 product categories, which is not far from the 650 reported in the EGA negotiations in May.

**The final agreement is, however, unlikely to include all 575 product categories.** Agricultural products, defined as HS chapters 1 – 24, are off the table from the outset. This includes bio-ethanol under sub-heading 220710 and 220720, but biodiesel included in 382490 may still be part of the negotiations<sup>1</sup>. Sources close to the negotiations note that many of the about 650 products submitted by the EGA members have been questioned and that a final agreement will likely include some 200 products beyond the APEC 54 list (ICTSD 2015b).

**Table 2: Lists of environmental goods**

List	No of HS6 product categories
<p><b>APEC EVSL</b> The Early Voluntary Sector Liberalization (EVSL) initiative from 1997 by the APEC was the first attempt to identify environmental goods.</p>	104
<p><b>OECD</b> The OECD list is a purely illustrative list developed for analytical purposes and not as a basis for negotiations</p>	123
<p><b>“Friends” list</b> An informal submission to the WTO negotiations under the Doha round by the so-called “friends of environmental goods” comprising Canada, the EU, Japan, South Korea, New-Zealand, Norway, Chinese Taipei, Switzerland and the USA. In the latest revision (WTO 2010), it includes 164 HS6-categories.</p>	164
<p><b>WTO-2011</b> A compilation by the Chairman of the CTESS in 2011 collecting all submissions by member states in the Doha round negotiations. This list also includes the Friends list.</p>	408
<p><b>World Bank</b> In 2007 the World Bank identified a set of core environmental goods, which was proposed for accelerated liberalization. This list is a sub-set of the Friends list.</p>	43

<sup>1</sup> In the latest revision of the HS nomenclature from 2012, biodiesel constitutes its own product category (382600). In HS-2002 (that we use), category 382490 contains both bio-diesel and a wide range of other chemical compounds.

<b>APEC-54</b> The list of 54 HS6 product categories slated for tariff reduction to 5% by the APEC countries.	54
<b>ICTSD mapping studies</b> The International Centre for Trade and Sustainable Development (ITCSD) conducted three mapping studies on climate-mitigating technologies related to three specific subsectors: Renewable Energy, Transportation and Residential and Commercial Buildings.	188
<b>Base list</b> We define the base list of the most likely environmental goods to be included in the EGA as the Friends list combined with the APEC-54.	171
<b>Gross list</b> This is the combination of all lists proposed so far, accounting for overlaps.	575

Source: Own calculations based on APEC (2012), Jha (2009), Steenblik (2005b), Sugathan (2013a), Wind (2010), World Bank (2008), Vossenaar and Jha (2010b), WTO (2010), WTO (2011).

**The statistical analysis in this report is based on a “base list” of environmental goods consisting of the Friends list and APEC-54.** We use trade and tariff data according to the 2002 HS-revision. This base list is used as a “best guess” of the set of environmental goods most likely to form the basis for a future EGA. The list includes 171 HS6 categories, and may be on the low side of the future EGA. However, it has the advantage of transparency and the proven support of several of the central parties in the negotiations, including the EU, Japan and the USA. We view the broader gross list of environmental goods as a pool of potential products that could be added to the agreement, before the conclusion of the agreement or after. In the statistical analysis of LDC interests, we search through the gross list for products of potential interest to the LDCs.

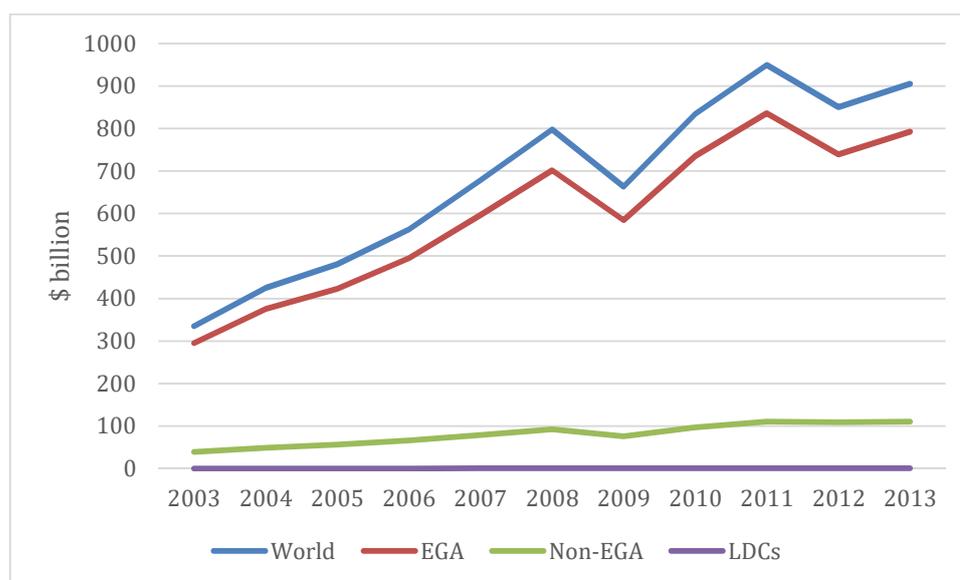
**Throughout the analysis, the numbers should be viewed as upper limits of the effects of an EGA rather than precise estimates.** The available data is specified at the 6-digit level, while most environmental goods are designated at a more disaggregated level through the use of ex-outs as noted above. This means that the trade flow numbers presented here include both environmental goods and products likely to be excluded from the EGA through ex-outs.

### 2.2.3 Global trade in environmental goods

**World trade in environmental goods has nearly tripled in 10 years to reach \$900 billion in 2013, see figure 1.** The steady increase in this trade, representing an average annual growth rate of roughly 10%, was temporarily interrupted by the global financial crisis in 2008 and again in 2011. Nearly 90% of the global environmental goods trade are exported from countries participating in the EGA negotiations, notably participating OECD countries plus China. Total LDC exports are miniscule.

**However, increasing environmental goods exports do not represent a shift in trade patterns towards greener trade.** On the contrary, environmental goods have largely maintained a steady share of world trade, at little more than 6% of total trade, suggesting that the increase in green trade more or less follows the general expansion in world merchandise trade over time. The countries participating in the EGA negotiations have focused their exports slightly more on environmental goods, while the share of environmental goods in the rest of the world has declined slightly, but overall the trade pattern is stable over time.

**Figure 1: Exports of environmental goods, 2003 - 2013**



Source: Own calculations based on data from the BACI database, HS 2002 revision

**Table 3 presents exports and imports of environmental goods both for selected countries and for four groups of countries.** The groups of countries are the world, EGA negotiating countries, all other countries and LDCs. For each group, the table indicates the four top exporters and the table also includes Myanmar because it is chosen as a case country in this report. All numbers are from 2013.

**Earlier plurilateral agreements, such as the Information Technology Agreement (ITA), adopted a critical mass threshold of approximately 90% of global trade as a precondition for the agreement to take effect.** The idea of a critical mass threshold is to reduce incentives for free riding. Since plurilateral agreements require signatories to liberalize tariffs on an MFN-basis to be consistent to WTO legislation, countries which are not part of the agreement also gains from the improved access to the markets of the signatory countries without having to reduce their own tariffs. A critical mass threshold of 90% ensures that most of the countries benefiting from the agreement also contribute to it. Likely, the EGA will include a critical mass threshold, but the negotiators are still to agree on its size (Vossenaar 2014). Table 3 suggests that reaching a reasonable critical threshold will be unproblematic.

**Table 3: Exports and imports of environmental goods, 2013**

	Exports			Imports		
	\$ billion	% of country exports	% of world exports	\$ billion	% of country imports	% of world imports
<b>World</b>	<b>905.03</b>	<b>6.1</b>	<b>100.0</b>	<b>905.03</b>	<b>6.1</b>	<b>100.0</b>
<b>EGA</b>	<b>792.02</b>	<b>8.4</b>	<b>87.5</b>	<b>605.97</b>	<b>6.0</b>	<b>67.0</b>
EU	222.65	10.0	24.6	113.76	4.8	12.6
China	189.02	8.4	20.9	123.08	7.9	13.6
United States	124.06	8.7	13.7	131.86	6.2	14.6
Japan	88.56	12.0	9.8	35.59	4.6	3.9
<b>Non-EGA</b>	<b>110.78</b>	<b>2.1</b>	<b>12.2</b>	<b>297.22</b>	<b>6.7</b>	<b>32.8</b>
Mexico	27.92	7.5	3.1	36.13	10.2	4.0
Malaysia	12.78	4.9	1.4	12.62	6.6	1.4
Thailand	11.90	5.0	1.3	19.55	8.4	2.2
India	11.00	3.8	1.2	17.94	4.2	2.0
<b>LDCs</b>	<b>0.94</b>	<b>0.4</b>	<b>0.1</b>	<b>13.30</b>	<b>5.2</b>	<b>1.5</b>
Bangladesh	0.30	1.0	0.0	1.46	4.4	0.2
Tanzania	0.12	2.1	0.0	0.47	3.6	0.1
Cambodia	0.07	0.5	0.0	0.54	3.4	0.1
Myanmar	0.04	0.4	0.0	1.18	6.6	0.1

Source: Own calculations based on data from the BACI database, HS 2002 revision

**Table 3 also suggests that a country's export interests decide whether it joins or stays out of the negotiations and if it joins which goods it suggests for liberalization.** Countries that negotiate the EGA and countries that do not both spend about 6% of their total import bill on environmental goods. But for EGA participants the export of environmental goods constitute around 8% of their total exports, for the EU and Japan that number is 10-12%. For the world as a whole, that figure is only around 2%. EGA participants as a group have a positive net exports of environmental goods, whereas net exports is negative for countries that have so far chosen to stay outside the negotiations.

**Based on export interests, LDCs have very little interest in the EGA negotiations.** LDCs export less than \$1 billion of environmental goods, constituting 0.1% of world trade, and environmental goods make up only about 0.4% of total exports from these countries. Bangladesh, Tanzania and Cambodia are the largest environmental goods exporters among the LDCs, but even for these countries, environmental goods exports represent at most 1-2% of total

exports. On the import side, however, LDCs are almost in line with the rest of the world. A little more than 5% of LDC imports is environmental goods.

**Interviews with developing countries' delegations in Geneva made it clear that LDCs show little interests in EGA negotiations.** We interviewed in person or by telephone LDC delegates from Rwanda, Ethiopia, Bangladesh, Mozambique, Myanmar, Tanzania and Zambia. The general picture was clear: Few of them had followed the EGA negotiations, much less developed a position on the issues. We hypothesize that the stakes for LDCs are too small to warrant the devotion of resources to the negotiations. We also interviewed delegates from Vietnam and Thailand to gauge the interests of middle income countries. Both countries were following the negotiations and Thailand was consulting with its own producers of environmental goods to develop official positions. Neither country expressed interest in joining the negotiations soon.

**Table 4 presents the average tariffs, minimum and maximum tariffs on environmental goods by the same countries and groups of countries as in table 3.** Tariffs on environmental goods are already fairly low; on average 6.5%

**Table 4: Import tariffs on environmental goods**

	Tariffs		
	Simple average	Minimum	Maximum
<b>World</b>	<b>6.5</b>	<b>0.0</b>	<b>90.0</b>
<b>EGA</b>	<b>3.4</b>	<b>0.0</b>	<b>35.0</b>
European Union	2.0	0.0	12.0
China	7.2	0.0	35.0
United States	1.3	0.0	10.3
Japan	0.3	0.0	5.3
<b>Non-EGA</b>	<b>7.1</b>	<b>0.0</b>	<b>90.0</b>
Mexico	4.0	0.0	20.0
Malaysia	7.6	0.0	40.0
Thailand	5.0	0.0	30.0
India	8.1	0.0	10.0
<b>LDCs</b>	<b>8.6</b>	<b>0.0</b>	<b>40.0</b>
Bangladesh	8.7	2.0	25.0
Tanzania	5.9	0.0	35.0
Cambodia	15.0	7.0	35.0
Myanmar	2.2	0.0	15.0

Source: Own calculations based on data from WITS, latest year.

globally and only 3.4% among the EGA members. This partly reflects the nature of environmental goods. These are primarily industrial (and in many case high-technology) products and the heavily protected agricultural products are excluded from the negotiations. LDCs, on average, also impose relatively low tariffs. Despite the low average tariffs in EGA countries and LDCs alike, tariff peaks on some products are still substantial. In China, Tanzania and Cambodia, for example, the highest tariffs are 35%, a figure that suggests that in certain sectors market access can still be improved by reducing tariffs.

### 3. How the Environmental Goods Agreement may impact LDCs

#### 3.1 *Market access*

**This section analyses market access from three angles.** First, it analyses LDCs current trade flows of potential environmental goods in order to identify the products of most export interest to LDCs. Second, it investigates the potential of LDCs to supply global environmental good value chains. Thirdly, the section looks beyond the EGA negotiations' current focus on tariff reduction and discusses how LDCs would fare if non-tariff measures in the form of standards and sustainability criteria become a part of a future EGA.

##### 3.1.1 *LDC exports of environmental goods*

**LDCs export very few environmental goods and even fewer will be covered by the EGA.** Table 5 summarizes LDC exports of environmental goods and the tariffs LDCs pay to foreign countries for those exports of environmental goods. Here we discuss the export figures. The table gives both world exports and exports to the EGA negotiating countries. Less than half a per cent of LDC total exports are environmental goods (as defined in this study) and about a third of that half per cent is exported to the EGA negotiating countries. The major share of LDC exports of environmental goods is destined for neighbouring countries, primarily other larger developing countries. For instance, as the main trading partner of Bangladesh, India takes more environmental goods exports from LDCs than the EU. Other major destinations are Thailand, Pakistan and Kenya. In other words, a vanishingly small share of 0.16% of LDC exports would enjoy the benefits of tariff reductions if LDCs were to join the EGA.

**Table 5: LDC exports of environmental goods and tariff payments, 2013**

	Environmental goods exports				Tariff payments	
	\$ million		% of total exports		\$ million	% of total tariff payments
	All countries	EGA countries	All countries	EGA countries		
<b>LDCs</b>	<b>943.4</b>	<b>333.1</b>	<b>0.45</b>	<b>0.16</b>	<b>0.41</b>	<b>0.01</b>
Afghanistan	4.3	2.8	0.59	0.39	0.01	0.02
Angola	32.8	26.7	0.05	0.04	0.00	0.00
Bangladesh	303.6	96.8	0.98	0.31	0.35	0.03
Benin	3.2	1.0	0.34	0.11	0.00	0.00
Bhutan	0.1	0.1	0.07	0.05	0.00	0.09
Burkina Faso	8.6	3.2	0.32	0.12	0.00	0.00
Burundi	0.2	0.2	0.31	0.21	0.00	0.00
Cambodia	70.3	6.7	0.51	0.05	0.00	0.00
Central Afric. Rep.	0.7	0.1	0.61	0.05	0.00	0.00
Chad	1.0	0.3	0.04	0.01	0.00	0.00
Comoros	0.2	0.1	0.27	0.19	0.00	0.00
Congo, Dem. Rep.	3.9	0.9	0.05	0.01	0.00	0.00
Djibouti	1.1	0.2	1.47	0.33	0.00	0.00
Equatorial Guinea	8.7	6.8	0.07	0.05	0.00	0.00
Eritrea	9.5	0.2	3.77	0.07	0.00	0.00
Ethiopia	19.1	17.3	0.49	0.44	0.00	0.00
Gambia, The	0.2	0.1	0.10	0.05	0.00	0.00
Guinea	0.9	0.5	0.05	0.03	0.00	0.00
Guinea-Bissau	0.0	0.0	0.01	0.00	0.00	0.00
Haiti	0.5	0.4	0.05	0.04	0.00	0.00
Kiribati	0.1	0.1	0.12	0.10	0.00	0.00
Lao PDR	5.1	1.6	0.17	0.05	0.00	0.00
Liberia	2.7	1.9	0.24	0.17	0.00	0.00
Madagascar	15.3	9.7	0.70	0.44	0.00	0.01
Malawi	8.7	0.2	0.63	0.02	0.00	0.00
Mali	1.7	0.5	0.32	0.10	0.00	0.00
Mauritania	1.3	0.4	0.03	0.01	0.00	0.00
Mozambique	63.1	16.1	0.91	0.23	0.00	0.00
Myanmar	36.4	26.2	0.39	0.28	0.01	0.00
Nepal	51.8	0.8	5.75	0.09	0.00	0.02
Niger	27.6	27.1	0.90	0.88	0.02	0.00
Rwanda	3.1	0.3	0.34	0.03	0.00	0.00
Sao Tome & Princ.	0.4	0.3	3.42	2.75	0.00	0.00
Senegal	7.8	3.2	0.68	0.28	0.00	0.00
Sierra Leone	5.7	3.2	0.38	0.21	0.00	0.01
Solomon Islands	0.3	0.2	0.04	0.04	0.00	0.00
Somalia	0.2	0.1	0.04	0.03	0.00	0.00
Tanzania	118.0	55.2	2.11	0.99	0.00	0.00
Togo	23.8	1.8	1.31	0.10	0.00	0.00
Tuvalu	0.0	0.0	0.15	0.15	0.00	0.00

	Environmental goods exports				Tariff payments	
	\$ million		% of total exports		\$ million	% of total tariff payments
	All countries	EGA countries	All countries	EGA countries		
Uganda	47.3	4.6	1.78	0.17	0.00	0.00
Vanuatu	4.3	0.0	1.26	0.01	0.00	0.00
Yemen	16.0	10.2	0.17	0.11	0.00	0.00
Zambia	33.6	4.5	0.28	0.04	0.00	0.00

Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year.

**Bangladesh illustrates well that a very small part of LDC exports would be covered by the EGA despite Bangladesh having the strongest capacity in manufacturing of all LDCs.** In 2013, Bangladesh exported \$303 million or almost one third of LDC environmental goods exports and is by far the biggest LDC exporter. These \$303 millions worth of goods represent only about 1% of Bangladesh total and a little less than a third of the \$303 million went to the EGA countries.

**The EGA will reduce LDC tariff payments only marginally.** To illustrate that the EGA will only lead to minor savings for LDC exporters, table 5 also shows LDC tariff payments for their environmental goods exports. We estimate these payments by multiplying the bilateral trade flows with the tariff that the country faces on the export market taking into account trade preferences enjoyed by the country on each particular market. For all LDCs combined, total tariffs saved amounts to roughly \$410,000 or 0.01% of total tariff payments. The very small numbers reflect LDCs' low environmental goods exports and the low tariffs that LDCs meet on their export markets due to tariff preferences. Several LDCs pay no tariffs at all and will therefore see no change in market access conditions due to the EGA. We estimate that the EGA will save Bangladeshi exporters around \$350,000 in tariffs, corresponding to 0.3% of total tariffs paid, and for all other LDCs the savings even smaller.

**Likely, the EGA will preserve LDC trade preferences.** While table 5 suggests that the EGA will not significantly open more markets for LDCs, theoretically the agreement could hurt the LDC export interests through preference erosion. LDCs

enjoy trade preferences in most EGA countries and the tariff reduction that an EGA will lead to can erode this advantage. But at an average of 3.4% EGA country tariffs are already low so LDC preferences are weak. Furthermore, LDC and non-LDC exporters seem to compete in different markets. Higher income countries export mainly renewable energy and wastewater management technologies, while LDCs export mostly EPPs.

**Our conclusions on LDC export interests are sensitive to the choice of goods to liberalise in the final agreement.** The negotiators keep the list of products they discuss secret. Yet, by searching through our “best guess” base list of environmental goods and the broader list of potential environmental goods from the literature, we can identify the specific products with the largest potential export interest among LDCs.

**LDC export interests are highly concentrated implying that their small market access benefits will be even smaller if negotiators exclude a few products from liberalisation.** On our base list of 171 HS6 product categories, just five categories represent 55% of all environmental goods exported by LDCs to the EGA countries, and a select few LDCs cover the bulk of exports. Table 6 lists these five products and the most important exporters<sup>2</sup>. Two of the five products, jute (HS 530310) and sacks and bags made from jute (HS 630510) constitute 21% of LDC exports covered by the base list. They are the most prominent examples of EPPs on the list, but sources close to the negotiation say that these product categories will not be part of the final agreement. The product category “Mirrors, prisms and lenses (HS 900190)” is usually qualified by an ex-out identifying only specialized “fresnel and parabolic mirrors” used to concentrate sun light in solar power plants, while simpler mirrors, prisms and lenses will be excluded. While the data do not allow the precise identification of LDC exports, they likely do not

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<sup>2</sup> We have also conducted the same analysis at the 4-digit level. In some product categories, the 6-digit categories are relatively detailed. For example, HS 8411, Other gas turbines includes HS 841181, gas turbines ≤ 5000 KW, and HS 841182, gas turbines > 5000 KW. The analysis at the 4-digit level aggregates such products to more concentrated categories. The 4-digit analysis generates the exact same picture as the 6-digit analysis, suggesting that LDC exports is indeed concentrated on a relatively few 6-digit product categories.

export the high-tech varieties covered by the EGA. Similar concerns could be attached to HS 901580 covering specialized instruments and appliances for measuring the ozone layer and monitoring the risk of earthquake, tsunamis and cyclones.

**Table 6: Top five LDC export of environmental goods to EGA members, 2013**

	Export value \$ million	% of all LDCs
<b>Jute and other textile bast fibres (HS 530310)</b>		
Bangladesh	35.3	76.6
Tanzania	10.8	23.4
<b>Mirrors, prisms and lenses (HS 900190)</b>		
Myanmar	23.8	59.3
Bangladesh	16.3	40.6
<b>Other gas turbines &gt; 5000 KW (HS 841182)</b>		
Tanzania	38.4	96.6
Angola	1.3	3,1
<b>Surveying, hydrographic, oceanographic, etc. (HS 901580)</b>		
Niger	20.8	59.7
Angola	6.3	18.1
Mozambique	1.6	4.6
<b>Sacks and bags, made from jute (HS 630510)</b>		
Bangladesh	21.6	90.1
Cambodia	1.8	7.5

Source: Own calculations based on data from the BACI database, HS 2002 revision

**To identify environmental goods that can offer market access benefits to LDCs and may be included in the EGA, we searched the broader list of environmental goods and talked to sources close to the negotiations.** Table 7 lists such alternative environmental goods. During earlier negotiations under WTO, Saudi Arabia and Qatar supported natural gas as an environmental good. Natural gas is controversial as it is a fossil fuel, yet it emits much less CO<sub>2</sub> compared with competing fossil fuels. Some LDCs, including Yemen, Angola and Myanmar export natural gas to EGA countries, but these countries import almost all of it duty free. And since the EGA negotiating countries have low or zero MFN tariffs on natural gas, the risk of preference erosion is minimal. If natural gas were to be included in the final agreement, it would make little difference for the LDCs.

**EGA negotiators may classify waste and scrap metal from copper and other precious metals as EPPs because recycling scrap metal saves energy compared**

**with smelting metal from ore.** LDCs, including Zambia, Bangladesh, Benin, Yemen and Angola, export some recycled metals to EGA members. Yet, including such products in the agreement presents further challenges. Recycled scrap metal is identical to metal produced from ore, and LDCs would have to create costly certification schemes to allow buyers to know recycled from conventional metal.

**Table 7: LDC exports to EGA countries of alternative environmental goods, 2013**

	Export		Tariffs paid	
	\$ million	% of all exports	\$ million	% of total
<b>Natural gas (HS 2711)</b>	<b>6,024</b>	<b>2.8</b>	<b>2.1</b>	<b>0.0</b>
Yemen	2,494	26.4	0.0	0.0
Angola	406	0.7	2.1	1.0
Myanmar	128	1.4	0.0	0.0
<b>Bicycles (HS 871200)</b>	<b>498</b>	<b>0.2</b>	<b>0.1</b>	<b>0.0</b>
Cambodia	422	3.0	0.1	0.0
Bangladesh	76	0.2	0.0	0.0
<b>Copper waste and scrap (HS 740400)</b>	<b>226</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>
Bangladesh	38	0.1	0.0	0.0
Benin	33	3.6	0.0	0.0
Yemen	24	0.3	0.0	0.0
Angola	24	0.0	0.0	0.0
<b>Waste and scrap of precious metals (HS 711299)</b>	<b>71</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Zambia	68	0.6	0.0	0.0
<b>Wood, sawn or chipped (HS 440710)</b>	<b>65</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Cambodia	58	0.4	0.0	0.0
Mozambique	3	0.0	0.0	0.0
Tanzania	1	0.0	0.0	0.0

Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year.

**To tell apart EPPs from conventional products is a generic problem.** Cambodia, Mozambique and Tanzania harvest some of their wood sustainably and to access markets paying higher prices for sustainably harvested wood products, these countries need certification. At any rate, it makes little difference to LDCs whether such products are included or not, as no tariffs are applied by the EGA members.

**Among the products EGA countries might agree to liberalise, we identify bicycles as the only product LDCs have an interest in.** Cambodia is particularly

strong and in 2013 exported \$422 million worth of bicycles, of which 87% went to the EU. This trade is roughly half the size of the total LDC environmental goods exports as defined on our “best guess” base list. Bangladesh’s bicycle export adds another \$76 million, almost exclusively to the EU. These two countries are the second and third largest exporters of bicycles to the EU after Taiwan. However, due to already existing trade preferences, bicycle exports from LDCs can already enter the EU duty free. Thus, while including bicycles in the EGA will have little positive effect for Cambodia and Bangladesh, there is a risk that it could erode their preferences. The EU imposes MFN tariffs of 14-15% on bicycles and eliminating this would make the \$800 million exports from Taiwan even more competitive, at the expense of Cambodian and Bangladeshi exporters.

Besides the products listed in table 7, **sources close to the negotiations have mentioned biodiesel as a potential product of LDC interest.** However, according to Comtrade data, LDCs does not export biodiesel. Therefore biodiesel is not included in the table.

**Other studies analysing the EGA negotiations share our conclusion that LDCs export very few environmental goods but some studies disagree.** Wu (2014) exemplifies those that agree with us. He finds that developing countries as a group have little to gain from the EGA because they export few environmental goods and other trading arrangements, like preferential trade agreements and the APEC initiative, already covers most of the few environmental goods that they do export. Furthermore, developing countries will benefit from market openings anyway because EGA countries will liberalise using the MFN principle. Other studies that find that developing countries in general or LDCs in particular have few export interests in environmental goods include ICTSD (2008, 2009). Like us, ICTSD (2009) argues that green technologies are primarily produced by high and larger middle-income countries.

**Instead, UNCTAD (2005) and Hamwey (2005) argue that developing countries including low income countries and LDCs have strong interests in certain environmental goods.** In particular, these two papers argue that developing

countries at all development levels have large trade surpluses in EPPs, thus they would benefit if tariffs are cut for these products. But Hamwey (2005) and UNCTAD (2005) define EPPs so broadly that they become politically irrelevant for the EGA negotiations. For example, they define cotton and all cotton-based garments as EPPs, presumably because they view cotton as more sustainable than synthetic fibres. Cotton may or may not always be environmentally preferable, nevertheless the negotiating parties are extremely unlikely to accept large categories like cotton and cotton products to be defined as environmental goods, even if in the future the EGA countries start to discuss agricultural goods.

### *3.1.2 Accessing global value chains for environmental goods*

**Over the past quarter century, global value chains govern an increasing share of the fast growing global trade.** In such chains, the production is fragmented and trade in intermediaries is very common. A central actor – typically a multinational firm or a large retailer – organizes production. A paper published by the IMF finds that global value chains create ever more of world income in both industry and services. Trade in intermediaries is now more than two thirds of total trade. The paper also establishes that if a country has been linked up with global value chains since the mid-1990s, it tends to grow faster (Saito, Ruta and Turunen 2013).

**Many environmental goods are traded in global value chains.** Thus, an LDC can develop its green exports by integrating in global value chains. Bangladesh, Laos and Cambodia have already done so in garments. Integrating in environmental good global value chains allows an LDC to produce intermediary products while benefitting from the knowledge, marketing skills and finance of the large players governing the value chains. Global value chains are an entry point into green exports avoiding having to produce the often technologically demanding finished environmental goods.

**Jha (2009) is one of very few studies that analyse integration in global environmental goods value chains.** He focuses on renewable energy and finds

that among developing countries, only a few middle income countries participate. His study builds on Vossenaar and Jha (2010a) that identify intermediary and final products and track how they are traded to identify developing country participation. China is the world's biggest exporter of photovoltaic components and panels for solar energy production and Taiwanese and Indian exports of these products grow rapidly too. In wind turbines, India is the third biggest exporter. Brazil, China, India, Korea, Malaysia, Mexico, Singapore, Taiwan and Thailand export significant quantities of renewable energy components. But the rest of developing countries including all LDCs are marginalised in global renewable energy value chains.

**A recent study by the International Trade Centre, ITC (2014) reports that the Philippines has entered the global photovoltaic cells value chain.** Exports grew fast from near-nothing in 2006 to over \$1 billion in 2013 (thus largely after Jha (2009) did his study). This growth is largely attributed to foreign firms, like US SunPower or Solaria, outsourcing parts of the manufacturing process to the Philippines. ITC (2014) attributes the Philippine success to the prior existence of an electronics industry and the supply of skilled labour, in particular a large number of engineers. LDCs are still not at the level of development that the Philippines was when it integrated in global environmental goods value chains.

### *3.1.3 Standards and sustainability criteria*

**The EGA negotiations focus on tariffs, but some countries want to include options for reviewing and expanding the agreement in the future like a review clause, a work programme or both.** Such options might open the agreement to new products and discipline other policy instruments than tariffs. Standards are one such policy instrument. Standards are an essential part of many environmental goods. This is true for high technology components that only fit with other components if following exacting standards. It is also true for many EPPs. EPPs must be recognizable by the buyer as being environmentally superior to other similar appearing products. Therefore, it is often an intrinsic part of an EPP to define precisely how to distinguish, for example, a biodiesel that benefits

the environment from one that harms it. Sustainability criteria are a type of standards that are used to establish what constitutes an environmentally friendly biodiesel. Organic food is another example of an EPP. Naturally, a globally agreed standard on organic products is needed for organics to be recognized as an EPP.

**Developing countries mistrust including standards in trade and environment discussions.** This scepticism is based on some developing countries' past difficulties with complying with standards as for example food safety standards. Many developing countries have strong export interest in industries where compliance with standards is a major source of competitiveness. Especially LDCs have had difficulties (Abiola and Wilson 2004; Jaffee, Henson and Rios 2011; WTO and OECD 2013).

**The inclusion of standards will cause two interrelated sets of problems for LDCs: standards must be appropriate to LDCs and LDCs will need to demonstrate compliance.** To develop appropriate standards, standard setting bodies need to include LDCs. But LDCs lack the educated people, technologies and money to influence international standard setting. The lack of involvement risks excluding LDC producers if the standards do not acknowledge the often different production environments that these producers live in. An example is the setting of carbon labelling standards.

**Carbon labelling measures and displays the greenhouse gas emissions that a product causes.** Historically, analysts developed methods to calculate emissions based on high income countries because their knowledge on actual greenhouse gas emissions emanating from the varied production system around the world was very rudimentary in particular in developing countries. A study by Brenton, Edwards-Jones and Jensen (2010) analysed the consequences of applying a carbon measurement standard that does not acknowledge the production environment of an LDC in a case study of Zambian sugar production.

**The highest contributor to emissions was the emissions caused by clearing land for sugar.** The burning of a forest to make space for sugar, for example, emits much more greenhouse gases than the conversion of a wheat field to sugar. If the use of the land is unknown the standard assumes a worst case scenario consisting in clearing a virgin rainforest in Malaysia. In Zambia (and many other LDCs), land use patterns are not always recorded. Thus, in some cases the standard dictated the addition of an emission factor that would make Zambian sugar look much worse than high income country sugar. Had Zambia been involved in setting the standard, the standard might have included a more accurate way of dealing with the problem of missing land use information.

**LDCs lack the capacity in testing and certification to prove compliance with standards.** Generally, LDCs have not developed these trade support services (Abiola and Wilson 2004). Often, exporters requiring such services must import them at higher prices than what their higher income country competitors pay for similar services.

### *3.2 Access to imports*

**While trade negotiators typically view access to export markets as their goal and import liberalization as the price they have to pay to reach that goal, economic research shows that most of the welfare gains from trade liberalization come from the improved access to imports.** Gains from imports include both static gains occurring when the benefits to consumers from lower import prices outweigh the costs to import competing producers and dynamic gains from higher productivity and technology transfer.

**For LDCs, the transfer of technology is very important.** Eaton and Kortum (1996) demonstrated that for all countries but the technological front runners (United States, Japan, Germany, France and Britain), more than 90% of the economic growth arising from technological innovation is based on imported technologies.

### *3.2.1 Promoting access to environmental technology through the EGA*

**LDCs demand many environmental technologies and reducing the price of this technology will ease its adoption.** Table 8 presents LDC imports of environmental goods and the associated tariffs; information that we use to discuss how much liberalisation may ease the adoption of technology. Imports are measured in millions of dollars and as a share of total imports to illustrate the relative importance of environmental goods. Applied tariffs are presented as simple averages, along with the minimum and maximum.

**LDCs import more environmental goods than they export, around \$13 billion of imports compared to less than \$1 billion in exports.** This trade pattern reflects the high-technology nature of most environmental goods. On average, roughly 5% of total LDC imports are of environmental goods, close to the global average of 6%. Among the LDCs, Bangladesh, Angola and Myanmar are the largest environmental goods importers in absolute terms, partly reflecting the size of the economies, but Chad shows the greatest environmental goods imports relative to total imports of almost 13%.

**Tariffs on environmental goods are moderate in most cases - around 8.6% on average for all LDCs as a group.** However, tariffs vary between countries. 11 countries have average tariffs of more than 10%, 25 countries of between 5% and 10% and 8 countries of less than 5%. Djibouti has the highest average tariffs with 24.8% and Myanmar and Tuvalu the lowest with 2.2%.

**Tariff peaks are considerable in most countries.** Sudan has the highest tariffs on any environmental good in an LDC of 40%. 15 LDCs have tariff peaks of more than 25%, 26 countries of between 10% and 25% and only 3 countries, namely Afghanistan, Solomon Island and Yemen, of 10%

**Low but positive tariffs may also distort trade.** Several countries have minimum tariffs, which are small but strictly positive. Angola, Bangladesh and Eritrea apply tariffs as low as 2% and the minimum tariff rate in Djibouti is just 1%. Such

**Table 8: LDC imports of environmental goods and associated tariffs, 2013**

	Imports		Tariffs		
	\$ million	% of total	Simple average (%)	Min. (%)	Max. (%)
<b>LDCs</b>	<b>13,298</b>	<b>5.2</b>	<b>8.6</b>	0.0	40
Afghanistan	333	4.2	4.6	2.5	10
Angola	2,380	10.8	3.3	2.0	20
Bangladesh	1,463	4.4	8.7	2.0	25
Benin	194	2.5	8.9	0.0	20
Bhutan	22	8.8	13.7	0.0	30
Burkina Faso	216	5.1	8.9	0.0	20
Burundi	21	5.5	5.9	0.0	35
Cambodia	539	3.4	15.0	7.0	35
Central African Rep.	7	1.8	12.6	7.5	30
Chad	140	12.8	12.6	7.5	30
Comoros	45	7.0	12.3	0.0	20
Congo, Dem. Rep.	505	7.7	8.8	5.0	20
Djibouti	98	3.4	24.8	1.0	26
Equatorial Guinea	246	9.1	12.6	7.5	30
Eritrea	32	7.6	4.2	2.0	25
Ethiopia	838	6.1	12.9	0.0	35
Gambia, The	24	2.4	13.0	0.0	20
Guinea	155	4.2	8.8	0.0	20
Guinea-Bissau	8	3.6	8.9	0.0	20
Haiti	66	3.2	4.5	0.0	20
Kiribati	5	4.0	-	-	-
Lao PDR	563	8.8	6.2	5.0	30
Lesotho	-	-	3.2	0.0	20
Liberia	80	1.3	7.9	2.5	25
Madagascar	156	4.6	7.9	0.0	20
Malawi	96	3.2	5.2	0.0	25
Mali	125	5.0	8.9	0.0	20
Mauritania	249	4.3	9.6	0.0	20
Mozambique	412	4.0	6.9	2.5	20
Myanmar	1,185	6.6	2.2	0.0	15
Nepal	186	2.9	9.6	0.0	30
Niger	82	4.1	8.9	0.0	20
Rwanda	126	6.9	5.9	0.0	35
Sao Tome and Principe	4	2.6	9.8	5.0	20
Senegal	274	3.4	8.9	0.0	20
Sierra Leone	74	6.1	9.0	5.0	20
Solomon Islands	25	6.9	9.2	0.0	10
Somalia	19	1.1	-	-	-
Sudan	-	-	13.1	0.0	40
Tanzania	470	3.6	5.9	0.0	35

	Imports		Tariffs		
	\$ million	% of total	Simple average (%)	Min. (%)	Max. (%)
Togo	165	1.6	8.9	0.0	20
Tuvalu	1	2.2	2.2	0.0	33
Uganda	275	4.8	5.9	0.0	35
Vanuatu	17	4.6	4.4	0.0	20
Yemen	554	4.1	5.4	5.0	10
Zambia	823	8.1	10.7	0.0	25

Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year

“nuisance tariffs” generate little revenue, but may nevertheless restrict imports by forcing importers to go through cumbersome customs clearings procedures causing delays and adding transaction costs. No firm estimates of the costs of nuisance tariffs exist, but they may be substantial, not least in countries with less developed and overburdened customs institutions.

**The analysis suggests that even though LDC tariffs on environmental goods are low on average, participating in the EGA may still generate gains for some LDCs by promoting cheaper access to environmental technologies.** High tariff peaks still exist, and simplifying the tariff structure and eliminating nuisance tariffs could reduce transactions costs involved with getting imports through customs. However, such gains will only materialise if LDC governments and customs officials have the capacity to implement the agreement transparently and efficiently.

**In a study commissioned for the Norwegian Ministry of Foreign Affairs, Knudson, Aspen and Hermansen (2015) seek to identify goods of relevance to developing countries.** They focus on sanitation, on waste management, on water supply and availability, and on access to renewable energy. They argue that developing countries suffer from grave environmental problems that the import of technologies in these areas can address and identify fifteen products that embody such technologies. They suggest that these fifteen products are included in the EGA negotiations. This study, however, suffers from taking an exclusive supply-side approach. It does not evaluate whether the EGA will be an effective

and efficient means combat the environmental problems that they identify. Our analysis suggest that in many cases the contribution of tariff liberalisation to the transfer of technologies discussed by Knudson, Aspen and Hermansen (2015) will be small because tariffs are mostly moderate.

### *3.2.2 Technology transfer*

**Technology transfer has been a hot issue in several negotiations where both developed and developing countries are involved.** The WTO Working Group on Transfer of Technology was established by the Ministers in Doha and aims to examine the relationship between trade and the transfer of technology from developed to developing countries, and ways to increase the flow of technology to developing countries. Removing tariffs on environmental goods reduces the price of new technology. But many other factors influence technology transfer. Therefore the WTO has discussed technology transfer in several forums including in the Committee on Trade and Environment. Individual WTO agreements like the TRIPS Agreement also give rise to intense technology transfer debates. Probably most relevant for the EGA negotiations, the United Nations Framework Convention on Climate Change (UNFCCC) also work on technology transfer.

**The Conference of the Parties to the UNFCCC established the Technology Mechanism in 2010.** This mechanism - still under development - will deploy technology to support climate mitigation and adaption activities in developing countries. Supported activities can be research and development, demonstration, diffusion and transfer of technology (Blanco, Coninck and Würtenberger 2012).

**A study by the Intergovernmental Panel on Climate Change (IPPC) has identified potential constraints to technology transfer.** The constraints identified by the study are shown in Box 2. Such constraints are confirmed and

elaborated upon throughout the very large literature that exists on technology transfer to developing countries<sup>3</sup>.

### **Box 2. Potential constraints to technology transfer**

- Lack of full-cost pricing, which internalises environmental and social costs;
- Poor macroeconomic conditions, which could include underdeveloped financial sector, high import duties, high or uncertain inflation or interest rates, uncertain stability of tax and tariff policies, investment risk;
- Low private sector involvement because of lack of access to capital, in particular inadequate financial strength of smaller firms;
- Lack of financial institutions or systems to ensure initial investments for the utilisation and extended use of transferred technologies;
- Low, often subsidised conventional energy prices resulting in negative incentives to adopt energy saving measures and renewable energy technologies;
- Lack of markets for environmental goods and technologies because of lack of confidence in economic, commercial or technical viability, lack of manufacturers, lack of consumer awareness and acceptance of technologies;
- Lack of supporting legal institutions and frameworks, including codes and standards for the evaluation and implementation of environmentally sound technologies;
- Lack of understanding of the role of developed and developing countries and international institutions in the failures and successes of past technology cooperation;
- General lack of support for an open and transparent international banking and trading system;
- Institutional corruption in both developed and developing countries;
- Reluctance to identify and make available environmental goods and technologies that are in the public domain;
- Insufficient human and institutional capabilities;
- Inadequate vision about and understanding of local needs and demands;
- Inability to assess, select, import, develop and adapt appropriate technologies;
- Lack of data, information, knowledge and awareness, especially on "emerging" technologies;
- Lack of confidence in unproven technologies;
- Risk aversion and business practices that favour large projects in financial institutions including development banks;
- Lack of science, engineering and technical knowledge available to private industry;
- Insufficient research and development because of lack of investments in research and development and inadequate science and educational infrastructure;
- Inadequate resources for project implementation;
- High transaction costs;
- Lack of access to relevant and credible information on potential partners to allow for the timely formation of effective relationships that could enhance the spread of environmental goods and technologies.

Source: IPPC (2000).

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<sup>3</sup> For a couple of newer overview studies containing many case studies, see Ockwell and Mallet 2012 and Haselip et al. (2011).

**Examples of typical LDC problems include the lack of an enabling environment, poorly developed financial institutions, and distorted prices.** Many environmental technologies like hydro power require an enabling environment with laws conducive to foreign investment and standards that allow for the interoperability of the different components of a network, like an electrical grid. Many technologies are large scale and must be funded which require a welcoming attitude and a regulatory framework that allow for foreign direct investment. Capital to finance the investment is often scarce and expensive. In rural areas, capital even for small scale investment like household solar panels allowing access to electricity without connections to the national grid may be altogether absent.

**Energy prices are often subsidized which threatens the private profitability of investments in clean energy that are socially profitable.** Two sector studies discuss non-tariff barriers relative to tariffs specifically for renewable energy that is a key sector in the EGA negotiations. Jha (2009) found that subsidies and other incentives explain more of increased imports of renewable energy equipment than tariffs. Jha (2009) also observed that access to finance including venture capital and supportive policies including energy regulations, feed-in tariffs and concessionary loans all help establish a well-functioning market for renewable energy. Kirkegaard, Hanemann and Weischer (2009) study the wind energy industry and conclude that global integration of the industry is held back more by formal and informal non-tariff barriers distorting investments than tariffs.

### ***3.3 SDT and A4T***

**The Uruguay Round included articles on Special and Differential Treatment (SDT) for developing countries in every agreement.** SDT is also a major issue in the negotiations under the UNFCCC. The strong tradition for offering lenient terms to developing countries also influences the EGA negotiations. Sources close to the EGA negotiations report that developing countries like China seek SDT especially longer implementation periods for tariff reductions. However, high income countries are very reluctant to include SDT in the EGA negotiations

likely because environmental goods are primarily produced by relatively strong firms in middle income countries that compete with high income country firms.

**WTO practice allows for the possibility of differentiating in favour of LDCs.**

In fact, this is the only possibility beyond differentiating in favour of the full group of developing countries. However, EGA negotiators have not discussed that possibility because no LDCs have expressed interest in the negotiations.

**Another way of favouring developing countries in general and LDCs in particular is to offer development assistance to build capacity to exploit the benefits of trade potentially offered by trade agreements.** Such assistance for trade is called Aid-for-Trade or A4T. EGA negotiators have not discussed A4T in detail, but A4T has been a major issue in the parallel UMFCCC negotiations. However, developed and developing countries remain far apart (Diringer 2009). China and the principal group of developing countries including many LDCs the G77 have proposed that developed countries finance the development and adoption of new technology in developing countries with initiatives ranging from basic research to factory building. Developed country, however, are very reluctant to commit themselves to the high financial outlays and the risk of financially supporting future competitors.

### ***3.4 Policy space***

**The issue of policy space has been one of the most contentious issues in WTO debates.** UNCTAD (2004) defines policy space as the scope for domestic policies to pursue development, especially in the areas of trade, investment and industrial development. Whether policy space is desirable depends on ones view on the development process. Advocates of a liberal perspective view policy space arguments as excuses for protectionism while believers in the merits of more government intervention view policy space as the liberty of developing countries to apply a necessary set of instruments to overcome competitive disadvantages of a new industry. These instruments could include tariff protection and local content requirements contradicting WTO law.

**Policy space is a topic in green liberalisation discussions.** China, for example, refers to its developing country status when arguing for its right to apply industrial policy. Middle income countries not part of the EGA negotiations, like Brazil for wind turbines and India for solar panels, use tariffs to pursue industrial policy targeting the development of national industries (Vossenaar and Jha 2010). During fieldwork for this paper, the authors discussed industrial policy with the Thai WTO representation that does not participate in the EGA negotiations. Thailand wanted to protect its renewable energy industry. It should be noted that for many environmental goods, in particular for renewable energy, high income countries apply very active industrial policy although rarely tariff protection but subsidies and support to research and development.

**LDCs appear to be in a different situation than the middle income countries that are currently arguing for policy space for environmental goods.** LDCs are not strong manufacturing nations and none of them has environmental good industries they would want to protect. New environmental good industries will most likely target exports as LDC home markets are very small. An emerging environmental good industry would initially be based on assembly, thus requiring the import of components that would have to enter at low tariffs. The tariff protection instrument – the use of which a future EGA would discipline – would be an ineffective policy instrument.

### *3.5 Tariff revenue*

**Import tariffs are an important source of public revenue in most LDCs, especially those with few natural resources.** It is easier to tax imports at the few ports or border crossings than to tax incomes or turnover through more decentralized income taxes and VAT. Table 9 estimates the tariff revenue of LDC imports of environmental goods. We do not have data on collected revenue, but estimate revenue by multiplying imports of every good from every country of origin with the corresponding tariff rate.

**The total estimated loss of tariff revenue for all LDCs combined amount to roughly \$855 million, corresponding to nearly 4% of total tariff revenue.** The countries with the largest losses in absolute numbers are Bangladesh, Angola and Ethiopia due to their larger economies and higher-than-average environmental goods imports, and Cambodia due to its high tariffs on environmental goods. The shares of environmental goods tariffs are low in most countries, with 12 LDCs earning less than 3% of the total tariff revenue from environmental goods and 24 countries earning between 3% and 7%. Six LDCs, however, earn more than 7% on environmental goods with the Comoros, Chad and the Solomon Islands having the largest shares of, respectively, 11.8, 10.0 and 9.3%.

**For most LDCs, the numbers do not appear large if compared with other trade reforms.** For example, Fontagne et al. (2008) estimate that the EPAs between the EU and six ACP regions could result in losses of tariff revenue ranging from 5.7% to almost 44% of total tariff revenue for some LDCs. Also, the estimates in table 9 should be viewed as upper limits of the expected effects as we cannot account for the ex-outs specified under each HS6 category.

**Table 9: Estimated tariff revenue from imports of environmental goods, 2013**

Country	Tariff revenue		Country	Tariff revenue	
	\$ million	% of total tariff revenue		\$ million	% of total tariff revenue
<b>LDCs</b>	<b>855.0</b>	<b>3.9</b>	Liberia	5.2	0.9
Afghanistan	12.7	2.8	Madagascar	11.4	5.3
Angola	75.8	4.9	Malawi	3.0	2.4
Bangladesh	101.7	2.7	Mali	9.6	4.7
Benin	17.6	1.8	Mauritania	22.1	4.0
Bhutan	2.5	6.7	Mozambique	17.5	4.1
Burkina Faso	18.0	6.5	Myanmar	24.5	2.7
Burundi	1.2	5.6	Nepal	17.0	2.5
Cambodia	67.2	5.3	Niger	6.0	3.1
Central African Rep.	0.8	1.6	Rwanda	6.2	4.0
Chad	16.6	10.0	Sao Tome and Princip.	0.4	3.4
Comoros	6.8	11.8	Senegal	22.5	3.9
Congo, Dem. Rep.	44.9	6.2	Sierra Leone	6.0	5.2
Djibouti	29.9	1.5	Solomon Islands	1.9	9.3
Equatorial Guinea	29.3	7.5	Somalia	-	-
Eritrea	1.6	7.1	Sudan	-	-
Ethiopia	76.0	5.3	Tanzania	37.8	4.6
Gambia, The	4.5	3.2	Togo	14.9	2.3

Country	Tariff revenue		Country	Tariff revenue	
	\$ million	% of total tariff revenue		\$ million	% of total tariff revenue
Guinea	14.8	3.9	Tuvalu	0.0	1.2
Guinea-Bissau	0.7	3.0	Uganda	10.3	2.4
Haiti	4.0	3.1	Vanuatu	2.4	4.9
Kiribati	-	-	Yemen	26.5	5.3
Lao PDR	30.3	6.0	Zambia	52.8	9.9
Lesotho	-	-			

Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year.

### *3.6 Implementation costs*

**During the Uruguay Round, developing country undertook an unprecedented number of commitments, some of which proved much more costly to implement than foreseen.** Ever since, LDCs have been understandingly worried over the potential costs of new commitments.

**Prior to the Uruguay Round, the implementation costs of trade agreements were small because liberalising trade consisted mainly of general cuts in tariffs and the removal of quantitative restrictions.** The Uruguay Round introduced regulation on many beyond-the-border issues that required deep institutional reforms. This regulation was articulated in the SPS and TBT Agreements, the TRIPS Agreement, the Custom Valuation Agreement and several other agreements. Finger and Schuler (2000) have estimated that full implementation of the Uruguay Round commitments in such agreements would cost many LDCs the equivalent of a full year's development budget (Finger and Schuler 2000). LDC scepticism towards such agreements have been heightened by the fact that this type of agreement has to a large extent been included following pressure from high income countries with little input from LDCs in the negotiation of these agreements. Thus, LDC saw little need for these agreements and had little voice in their design, but had to carry the full costs of their implementation.

**The EGA will require changes in customs procedures because the Harmonized System used to classify goods for customs purposes does not allow customs officials to properly identify environmental goods.** The HS only standardizes products to the six digit level meaning that broad categories of goods are lumped together in aggregate categories including both environmental goods and conventional products.

**The EGA negotiators discuss two approaches to the problem presented by the current HS system.** Either to identify so-called “ex outs” that is individual environmental goods which must be separated from similar products without green credentials by reforming the HS codes thus creating internationally harmonized codes at a higher level than the current six digits. Or to adopt a more pragmatic approach and allow goods that are not environmental goods to be liberalised alongside environmental goods through the liberalisation of entire HS six digit level categories. The choice is between on one side the environmental credibility of an EGA and on the other ease of implementation. Reforming the HS system will lead to implementation costs of the EGA. Too many ex outs, and the difficulties of reforming customs procedures will increase.

**Many LDCs have reformed customs procedures over the two latest decades and the trend has been toward customs simplification.** LDCs have historically applied complex tariff schedules with highly variable tariffs for different products. The many different tariff levels have caused confusion for traders and been the basis for extended negotiations between customs officials and traders on how to classify goods. Customs simplification has aimed to reduce the multitude of different tariff levels and replace them with a few broad bands.

**Zake (2011) finds that most African countries have rationalized, simplified and reduced the number of tariff bands.** Tanzania exemplifies this approach. Prior to the establishment of the East African Customs Union of which Tanzania is a part today, Tanzania had reduced its tariff structure to five bands, namely 0, 5, 10, 20 and 35%. The formation of the East African Customs Union reduced the number of bands even further to three, namely 0%, 10% and 25%.

**LDCs could worry that an EGA and especially an EGA with many ex outs would threaten the gains already made through customs simplification.** A complicated EGA would remove tariffs on specific products while leaving others at their historical levels and therefore increase the complexity of the tariff schedule.

### *3.7 Green protectionism*

**Developing countries including LDCs often look with suspicion to linking of trade and environment fearing that environmental concerns will be misused as green protectionism.** LDCs may be worried that the EGA distinguishes between green goods and conventional ones and grants the first ones the best treatment. Developing countries including the LDCs have traditionally opposed ideas of distinguishing products by environmentally defined production methods. In the discussion of green liberalisation in the WTO Trade and Environment Committee, many developing countries did not submit lists of environmental goods because they were opposed to the idea of distinguishing between products on the basis of their production methods. They fear that even if an agreement of the liberalisation of environmental goods could be written in a way that accommodates their fears of green protectionism, the mere acknowledgement of the principle of differentiation on the basis of production methods could be used in other negotiations areas. LDCs likely fear that high income countries would hinder their imports because of the generally poor environmental conditions in LDCs (Howse and van Bork 2006). LDCs may face a difficult choice of viewing EPPs as examples of the differentiation between products on the basis of production methods against which they have been strongly opposed historically or as opportunities for the valuation of the environmental characteristics of parts of their export portfolio. Hamwey (2005) argues LDCs' potential for exporting environmental goods is based on EPPs.

#### **4. How the Environmental Goods Agreement may impact Myanmar**

**Myanmar is a country with 53 million inhabitants neighbouring Bangladesh and India to the North West, China to the North East, Laos and Thailand to the East and with a long coastline bordering the Andaman Sea to the South.** Myanmar is only just opening up after a prolonged period of political and economic isolation that ended after a series of political reforms were enacted during 2011-12. The opening has spurred a process of economic growth and restructuring that begins to change Myanmar society.

**Incomes are much lower than in the countries currently negotiation the EGA agreement.** The average Myanmar citizen earns \$1,270 yearly<sup>4</sup> while that average for the negotiating parties is almost 20 times as high, *e.g.* about \$23,000; ranging from Norway's \$103,050 to China's \$7,380<sup>5</sup>. The low income of Myanmar is a good indicator that the economic structure of the country is radically different from the one found in the negotiating parties. Myanmar exports primarily natural gas, mineral products, food and garments with virtually no domestic production of the advanced technologies that constitute nearly all the environmental goods discussed in the EGA negotiations.

**We visited Myanmar from August 16th to 23rd 2015 to conduct a case study on how the EGA will impact the country.** Our general analysis of LDCs did not identify an LDC likely to be strongly affected – positively or negatively – by the EGA. We chose Myanmar as our case because of its location in dynamic South East Asia that lead us to suspect that Myanmar is one of the LDCs most likely to benefit from global environmental goods value chains. We hypothesized that such value chains will benefit from Myanmar's abundance of cheap labour. Thus Myanmar might reap benefits from the EGA on the export side if it becomes a supplier of environmental goods components. On the import side, Myanmar needs access to green technology to combat environmental problems and to develop its energy sector. Among the LDCs, Myanmar has some of the lowest

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<sup>4</sup> Measured as Gross National Income (GNI) per capita.

<sup>5</sup> Calculated from the World Bank databank ([databank.worldbank.org](http://databank.worldbank.org)) using figures for 2014.

tariffs for imports of environmental goods with an average tariff of 2.2% and maximum tariffs of 15.0%. Yet the complex import regime of Myanmar gives reason to believe that non-tariff measures are substantial. In our case study, we focus on four issues: market access, access to imports, tariff revenue and implementation costs.

#### **4.1 Market access**

##### *4.1.1 Myanmar exports of environmental goods*

**Myanmar's exports of environmental goods are very small.** In 2013, Myanmar exported only \$36.4 million worth of environmental goods including \$26.2 million's worth for countries participating in the EGA negotiations (primarily China) as illustrated in table 10. These values correspond to 0.39% and 0.28% of Myanmar's total exports. But these small numbers may be vastly exaggerated. Most of the exports of environmental goods reported here (roughly 85%) is under the category, "HS 900190: Mirrors, prisms and lenses". Likely, an ex-out will detail that only "Fresnel and parabolic mirrors" used to concentrate sunlight in solar power plants will be covered by the EGA. To the extent that Myanmar's export under category HS 900190 mostly reflects other products under the product category, such as prisms or standard mirrors, the country's export of environmental goods may be far smaller than suggested here.

**Table 10: Myanmar exports of environmental goods and tariff payments, 2013**

	Exports				Tariffs paid	
	\$ million		% of total exports		\$1000	% of total
	All destin.	EGA	All destin.	EGA		
<b>Myanmar, total</b>	<b>36.4</b>	<b>26.2</b>	<b>0.39</b>	<b>0.28</b>	<b>91.6</b>	<b>0.02</b>
Mirrors, prisms and lenses (HS 900190)	31.1	23.8	0.33	0.25	-	-
Reservoirs, tanks, vats (HS 730900)	1.5	1.1	0.02	0.01	29.8	0.00
Other electrical machines (HS 854389)	0.3	0.3	0.00	0.00	-	-
AC generators (HS 850164)	0.1	0.1	0.00	0.00	-	-

Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year

**Myanmar exporters pay so little in tariffs on their export markets that the EGA is unlikely to influence their market access.** Most of Myanmar’s environmental goods exports already enter export markets on duty free due to preferential trading arrangements. Table 10 estimates that Myanmar’s environmental goods exporters pay less than \$100,000 in import tariffs.

**A search for alternative environmental goods, which are not represented on our “best guess” base list of products, reveals little beyond what is reported in table 10.** Myanmar’s primary export commodity is natural gas, which may be designated as an environmental good due to its relatively low CO<sub>2</sub> emission relative to competing fossil fuels. However, most of Myanmar’s natural gas exports are destined for Thailand, which is not part of the EGA, and none of the exports face any import duties anyway. So even if natural gas were to be included in the final agreement, Myanmar would see no change in its market access.

#### *4.1.2 Accessing global value chains*

**Few LDCs are strongly integrated in global value chains for manufactures. Bangladesh and to some extent Laos and Cambodia are exceptions because they produce for garment value chains.** If an opportunity exists for an LDC to

integrate into global environmental good value chain, it would be a South East Asian LDC because of the proximity to major industry players in countries like China and Korea who might want to locate parts of the value chain in an LDC.

**Myanmar is not likely to start producing components for global environmental goods value chains.** During fieldwork in Myanmar for this report, no local production of parts or components for environmental good value chains could be found. Even relatively simple products like household solar energy stations were imported assembled and ready to use.

**Myanmar is just beginning to integrate into the global garment value chain** (Jensen 2015). The industry has grown fast, doubling in size in about three years (MGMA 2015). Today, Myanmar exports for about \$1.5 billion a year. However, Myanmar remains a small exporter. Cambodia is about three times bigger, Vietnam and Bangladesh 10-15 times bigger and China more than 100 times bigger. The Myanmar garment industry looks towards the global brands that control the global value chains. The German sportswear brand Adidas has begun sourcing Myanmar garments and San Francisco-based GAP has announced it will buy from a South Korean firm owning factories in Myanmar. The brands only put technologically simple activities in Myanmar. Myanmar produces “cut, make and pack” garments, where the producer receives all materials (fabric, buttons, thread, etc.) and patterns from the buyer, produces according to the patterns and pack the garment for export. The level of technological sophistication displayed in such production is not yet sufficient to attract investors interested in the production of environmental goods.

#### *4.1.3 Standards and sustainability criteria*

**The Myanmar capacity to influence international standard setting and to certify compliance is very low** (Jensen 2015). This lack of capacity can diminish Myanmar’s ability to export EPPs under the EGA should Myanmar choose to join and should the right EPPs become recognized as environmental goods in the EGA.

**APEC discussed potential EPPs that could be of interest to Myanmar during the negotiations leading to the APEC environmental goods initiative.** These potential EPPs are primarily agricultural products not discussed by EGA negotiators. Indonesia pushed for the recognition of palm oil and rubber – that are both exported by Myanmar – as environmental goods. Despite numerous attempts, primarily developed APEC members rejected the idea. Especially palm oil is a controversial product because it is frequently linked with large scale deforestation and would threaten the environmental credibility of the initiative. However, it is perfectly possible to produce environmentally sustainable palm oil, but to recognize such palm oil as an environmental good would require international agreement on sustainability criteria and a credible certification mechanism.

**The case of forestry exemplifies the difficulties of using sustainability criteria in Myanmar.** In Myanmar, around 500,000 people depend on the production of forestry products. The export of forestry products constitutes about 10% of official Myanmar exports. Logging is an important source of income for ethnic minorities especially in the Kachin State along the Chinese border and in the Karen State along the Thai border (Woods and Canby 2011). Forestry is a contentious issue because of high rates of unsustainable and illegal logging and high activity in ethnic minority areas marked by civil conflict. Myanmar has no internationally recognized certification system (Republic of the Union of Myanmar 2014).

**The Ministry of Environmental Conservation and Forestry has established the Myanmar Forestry Certification Committee and tasked it with developing an internationally recognized certification scheme.** This Committee was established in 1998, yet progress has been modest. As a result, the teak forests that have made Myanmar forestry famous have become fragmented and greatly reduced.

## **4.2 Access to imports**

### *4.2.1 Promoting access to environmental technologies through the EGA*

**Myanmar imports of environmental goods are less concentrated than its exports.** Table 11 presents Myanmar's total imports of environmental goods and applied import tariffs alongside more detailed data on the most important import articles. The largest product category at the HS 6-digit level only represents 5.8% of all environmental goods imports. The table suggest that the number should be interpreted carefully. Most of the products listed in table 11 cover dual-use products and ex-outs. Tubes and pipes, water pumps and taps and valves all have important environmental uses in wastewater management, sanitation and water supply, but may also be used to transport other liquids with no environmental benefits. Towers and lattice masts of iron and steel are typically qualified by an ex-out identifying specifically wind turbine towers as environmental goods, but not other structures (e.g. mobile masts), and other articles of iron and steel may cover just about anything. Only the photosensitive semiconductor devices can with some certainty be designated as clear environmental goods. The numbers in table 11 are therefore likely to exaggerate somewhat the actual imports of environmental goods in Myanmar. Unfortunately, we do not have access to more detailed data, which could provide a more accurate estimate.

**Tariffs are very low but few environmental goods enter duty free.** This is potentially important as the trade restrictions generated by import tariffs are not just reflected in the size of the duty, but also by the delays and transactions costs caused by customs procedures. Several of the tariffs are set at 1% or 1.5% that amounts to very little tariff revenue, but may add substantial costs to importers.

**Table 11: Imports of environmental goods and applied tariffs in Myanmar, 2013**

	Imports		Tariffs		
	\$ million	% of total	Simple average	Min.	Max.
<b>Myanmar</b>	<b>1,185</b>	<b>6.6</b>	<b>2.2</b>	<b>0</b>	<b>15</b>
Centrifugal pumps (HS 841370)	69	0.4	0	0	0
Parts for combustion engines (HS 840999)	59	0.3	3.4	1	5
Towers and lattice masts of iron/steel (HS 730820)	58	0.3	1.5	1.5	1.5
Tubes, pipes & hollow profiles (HS 730660)	51	0.3	1.5	1.5	1.5
Other articles of iron and steel (HS 732690)	49	0.3	1.3	0	1.5
Taps, cocks and valves (HS 848180)	47	0.3	1	1	1
Photosensitive semiconductor devices (HS 854140) <sup>a)</sup>	46	0.3	7.5	7.5	7.5

Notes: a) Business representatives in Yangon reported that the government has recently eliminated the tariff on solar panels. The data reported here, based on the WITS database may be a bit outdated. Source: Own calculations based on data from the BACI database, HS 2002 revision, and WITS, latest year.

Besides environmental benefits produced by improved access to environmental technologies, simplifying the tariff structure and eliminating such “nuisance tariffs” may lower transaction costs.

**Table 11 suggests that the tariff on “photosensitive semiconductor devices” (solar panels) may be relatively high, 7.5%, but in this particular case, the numbers in the WITS database may outdated.** Some of business representatives we met in Yangon reported that imports of solar panels have recently become duty free.

#### *4.2.2 Technology transfer*

**While the tariffs for the import of environmental goods are generally conducive to the import of green technology, Myanmar struggles with a**

**number of other constraints to technology transfer.** This section looks at the case of renewable energy.

**Myanmar has one of the world's lowest rates of electrification.** Only a third of the population have access to electricity and most villages use traditional sources like kerosene lamps for lighting. The government – assisted by international donors like the World Bank, the Asian Development Bank (ADB) and the Japan International Cooperation Agency (JICA) – has committed to achieving universal electricity access by 2030. This plan implies that 7.2 million new households must be connected to a source of electricity within the next 15 years (World Bank 2014).

**Technologies are available that may address the energy needs of Myanmar.** Hydropower is the dominant source of electricity today, and could be developed much further. The wind energy company Vestas has signed an agreement with one of Myanmar's leading power developer Zeya & Associates that aims at developing projects for wind power. Myanmar also has unexploited geothermal potential. Finally, solar energy has high potential due to Myanmar's tropical location. Solar energy is a source of both large scale solar farm projects and small scale village and household projects that may deliver electricity to villages without access to the national electricity grid because solar energy is ideal for small and micro scale power plants.

**UNDP (2013) discusses the challenges Myanmar faces in energy access.** These challenges are summarized in table 12. UNDP (2013) paint a picture of Myanmar as a place where investments in renewable energy is deterred by both political and financial factors, a picture that is confirmed by the analytical work of other donors (ADB 2011). First, the government focuses on fossil fuel extraction mostly for export and on developing the central electricity grid rather than promoting renewable energy sources apart from large scale hydropower dams. Second, resources are few and hard to access. Private investments are scarce partly because Myanmar remains a state controlled economy with restrictions on foreign investment. Parliament is elaborating a new investment law, but has not adopted it yet. The resources of the government itself are scarce. The

government's resources have been curtailed by falling prices for Myanmar's natural gas exports. The banking system is heavily controlled and very inefficient. The rural population in particular faces big problems in accessing finance and even private firms in the capital of Yangon have difficulties in financing investments that would be profitable under normal interest rates. Third, government policy is uncoordinated and different agencies fight for control.

**Table 12. Summary of Challenges to Expanding Energy Access**

Challenge	Description
Conflicting priorities	The government remains focused on producing crude oil and natural gas for export to meet regional energy demands
	The government is committed to upgrading the national grid and building centralized hydroelectric, fossil-fuel, and even nuclear plants to power industrial and agricultural facilities instead of addressing off-grid energy access issues
Lack of resources	The country's state-controlled economy makes it difficult to procure international financing and investment in the energy sector
	A growing deficit and rising inflation constrain government budgets for electricity and energy
	Declining natural gas prices have further reduced state revenue available for energy projects
	Poor access to credit and limited rural banking networks compound efforts to give loans to energy-deprived households
Policy	More than a dozen government agencies opt for control and jurisdiction over energy and electricity planning
	Scores of actors in the private sector and civil society further complicate the regulatory landscape

Source: UNDP (2013), Table 10.

### **4.3 Tariff revenue**

**Protecting tariff revenue, a traditional argument for staying outside trade liberalisation agreements, is not a valid reason for Myanmar to not participate in the EGA negotiations.** Tariffs are already very low and we estimate

Myanmar's total loss of tariff revenue to be roughly \$24.5 million or 2.7% of all estimated tariff revenue. This is, however, too much. Accounting for dual-use products and ex-outs is likely to substantially reduce the import volumes designated as environmental and thereby the tariff exemptions.

#### *4.4 Implementation costs*

**During fieldwork, the authors interviewed a series of firms supplying off grid solar technology to remote villages.** Such technologies include solar lamps and solar battery charging stations. Villagers use the technology for lighting and to charge cells phone and similar small electronics. Solar battery charging stations may be the basis for a small village business selling charging services to their community.

**In Myanmar, imports are subject to complex and intransparent procedures including import permits and customs classification and valuation often causing considerable delays that increase costs and decrease the flexibility and predictability of the importer.** The importers of solar technology universally complained about the lack of transparency of customs procedures. Overall, tariff rates are low, but as one importer stated "they are different for every shipment". The costs caused by these procedures create an additional burden to the tariffs imposed.

**The nature of the technology imported partly explains the intransparent customs procedures.** The firms supply the technology as a package containing a small solar panel (typically ranging between the sizes of an A5 and an A4 sheet), battery, charger, lamp, USB outlet and wires. Each individual component may fall under its own individual tariff line. The customs officer will need to decide how to treat the technology. Importers report that this leads to lengthy negotiations. Some officials will put the full package under one tariff line, others will try to assess the total value of the package and calculate a compound tariff. Importers complain that customs officials do not trust the documentation supplied. A shipment is accompanied by a commercial invoice and a customs

value declaration indicating the type of equipment and its value, but rather than trust these, customs officials often search the internet to assess what they regard as the true value of the product.

**Why the customs officials do not apply procedures uniformly and predictably is unknown.** One explanation is that much of the technology imported is new to Myanmar and thus unknown to the officials. Another is that by creating uncertainty about the proper valuation and classification of the technology, the officials establish negotiation issues that can eventually be settled through unofficial payments. No matter what the reason is, it is certain that the basis of the system is the complexity of the tariff schedule requiring different pieces of the technology to be treated differently.

**Importers interviewed state that their main concern is not tariffs to be paid, because tariffs are generally low in the order of between 0% and 10%.** They are worried about the costs of delays and the lack of predictability. If Myanmar were to join a future EGA, the problem of complex and intransparent customs procedures may worsen if the EGA would include many ex outs. Thus, what would be a liberalisation in theory because tariffs would officially fall – although not much because they are already low – could in practice hinder trade through the increased costs of intransparent customs procedures.

## 5. Conclusions and policy recommendations

**The EGA currently being discussed will neither benefit nor harm LDCs.** LDCs exports will hardly be affected. LDCs export about \$1 billion of environmental goods equivalent to about half a per cent of their total exports. LDCs export a third of the total to the countries negotiating the EGA, thus the EGA will reduce the tariffs of this third only. The aggregate impact of the EGA on LDCs export performance will therefore be very small. Furthermore, LDCs already access the markets of most EGA negotiating countries tariff free due to preferential trading arrangements. China is the major exception.

**The impact on individual industries looks to be insignificant in most cases too.** The environmental goods being discussed in the EGA are almost exclusively technology intensive manufactured products traded in global value chains that LDCs are not taking part in. We analysed the potential of Myanmar to integrate into such value chains. Myanmar is, because of its large size and its location in dynamic South East Asia, one of the best placed LDCs to export through global environmental goods value chains. But Myanmar is already struggling to integrate into simpler garment value chains and the South East Asian countries experiencing increased integration are middle income countries like Thailand and the Philippines.

**LDCs need green technologies to combat a multitude of environmental problems, but in most LDCs the EGA is unlikely to provide significantly better access to these technologies.** In total, LDCs import about \$13 billion's worth of environmental goods, more than ten times of what they export – a trade pattern that reflects the high-technology nature of most environmental goods. To increase imports and thus exploit available green technologies, LDCs can join the EGA negotiations (or unilaterally lower tariffs). Tariffs will not, however, fall much in most LDCs because LDCs tax their environmental goods imports moderately. The average tariff is 8.6%. For selected industries in selected LDCs cutting tariffs is a tool to increase imports because for these industries and countries tariff peaks of up to 40% are in place. Eleven LDCs have relatively high

average tariffs (more than 10%). It is, however, an open question how technology transfer will react to moderately lower prices of imported technology brought about by cutting import tariffs. In Myanmar, for example, many factors beyond price constrain the adoption of renewable energy technology, like adverse government policy and low private investment.

With LDCs unlikely to gain new markets and almost as little likely to increase the use of green technology, the EGA under negotiation looks like an insignificant agreement for them. **But the EGA might evolve over time and if it does, it may become more relevant to the LDCs.** Some EGA countries push to include a review mechanism that could open the agreement to new products and market barriers in the future. Observers like UNCTAD (2005) and Hamwey (2005) argue that LDCs will have strong export interests in the inclusion of many EPPs. Yet, we find that the types of EPPs discussed by these two observers are improbable to be included in the future both because of many EGA countries reluctance to include agricultural goods and the questionable environmental benefits of EPPs like cotton and cotton-based products.

**The inclusion of non-tariff measures could interest LDCs.** Standards and sustainability criteria have been mentioned as measures likely to be included. If the EGA evolves into a forum for settling difficult questions of what is perceived to be a “green” product, LDCs will want to participate in those discussions. Because of the economic weight of the EGA countries, standards and sustainability criteria adopted under a future EGA will become de facto global standards. They may become reference points even for products not covered by the EGA.

**Should LDCs decide to join the EGA, the demand for both SDT and A4T is limited if the EGA only includes environmental goods from the list being negotiated now.** The main issues are assistance to tax reform, compensation for lost tariff revenues, and assistance to technology transfer. An EGA with many ex out complicates the tariff schedule and go against the trend in customs reform in developing countries towards simplification. As the Myanmar case study

exemplified, LDCs struggle when tariff schedules are complex. A limited number of LDCs earn a sizeable share of their tariff revenue from environmental goods and will need compensation if cutting tariffs on such goods. Compensation could be in the form of assistance to customs reform that identifies new sources of revenue. Technology transfer is a most complex issue and various mechanisms to promote it are already under development, for example under the UNFCCC. It appears more sensible to view technology transfer as a broad capacity building issue than a narrow trade issue especially as the impetus to it from the EGA looks to be minimal for LDCs.

**The demand for SDT and A4T may be much higher if the EGA expands to regulate more complex market barriers like standards and sustainability criteria.** The EGA most likely to be adopted – a narrow EGA focusing on tariff reductions on high technology products and components – will incorporate a strong element of SDT to LDCs in the form of extension of any benefits agreed through the MFN principle. But the EGA countries cannot extend the benefits of negotiations on standards and sustainability criteria to LDCs in the same way. The MFN principle would dictate that LDC products should adhere to agreed standards the same way as for the products of EGA countries (and of all other WTO members). But the LDCs’ interests are not only to be treated in the same way; rather their interests are in influencing the substance of the standards. That influence they can only get by joining the EGA. To participate effectively in the technically demanding issues of standards and sustainability criteria, LDCs would need A4T.

**The interests of LDCs in international trade negotiation are a Danish priority as is the conclusion of the EGA negotiations.** These two priorities are aligned. The EGA under negotiation does not harm LDC interests. A future EGA incorporating more products and more market access barriers offers opportunities to offer benefits to LDCs. These benefits will be the inclusion of carefully chosen EPPs and the regulation of non-tariff measures like standards and sustainability criteria. The exact choice of products and the degree to which

LDCs will be able to take part in the discussion of non-tariff barriers will determine how successful they will be in enjoying the benefits of this future, larger EGA. Denmark can play an important role in supporting LDCs to choose the right EPPs for liberalisation and to discuss non-tariff barriers.

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