



Department for
International Trade



How do Technical Barriers to Trade impact trade in environmental goods?

UK presentation to TESSD, 19th July 2022

Introduction



The Department for International Trade has conducted an investigation to better understand where TESSD members can work together to reduce the burden of Technical Barriers to Trade on Environmental Goods.

The **2021 TESSD Ministerial Statement** set out the importance of enhancing **trade in environmental goods and services**. As part of the **UK's priorities on green trade**, we have carried out an **international assessment of the impact of technical barriers to trade in environmental goods**. **Technical barriers to trade** are considered within other **World Trade Organisation fora**.

Technical regulations lay down mandatory product characteristics or their related processes and production methods

They cover **multiple requirements** such as, product size, weight, composition, packaging, marking, labelling.

Many domestic technical requirements are **vital in international trade** as they **guard against deceptive practices** and **pursue legitimate policy objectives** such as protecting consumer health or preventing ecological or agricultural damage. Even more, some technical requirements directly **support environmental goals**.

However, some can be **counter-productive** and **reduce trade** in environmental goods. For example, technical barriers to trade have an **ad-valorem equivalent** of between **5% and 12.4%** (*Cadot, Gourdon and Tongeren, 2018*).

TBTs account for **34% of the 89,421 non-tariff measures** (e.g. quotas) recorded on UNCTAD's database. Whilst it could be useful to extend the approach to NTMs, TBTs are a significant subset to start with.



Key findings and aims

Aims:

- To improve our collective understanding of relevant technical barriers to trade.
- Initiate a more detailed discussion of non-tariff barriers to trade in environmental goods.
- Offer a methodological framework for further study.
- Suggest potential actions members could take to reduce the impact of inefficient TBTs.

UK data analysis has identified **two key areas** for further investigation and potential **collaboration**:

- **Addressing global imbalances in technical barriers to trade on environmental goods**
 - *Technical requirements can reduce the ability of developing economies to export to more developed regions e.g. due to compliance costs.*
- **Duplicative iterations of technical requirements on environmental goods**
 - *Similar technical requirements, implemented differently across jurisdictions, can create TBTs for environmental goods. This means there is scope for greater regulatory cooperation and working together to push for the use of international standards in developing regulations*

We have carried out **case studies** on these areas, to better understand the **international prevalence** of TBTs and to explore ideas for how the **international community** could **work together** to enhance trade in environmental goods.

Methodology



1 Compiled a dataset of **520 HS6 codes** published in several current and historical multilateral environmental goods lists (WTO, OECD, APEC and UNEP).

CAVEAT: We are not suggesting that this is a definitive list of 'environmental goods.' We deliberately chose not to judge the content of past lists.

2 Export UNCTAD **TRAINS data** for these HS6 codes, showing the **11,835 bilateral and global TBTs** that have been applied on imports.

3 Map that across to **bilateral trade data from CEPII**, allowing analysis on the value of exports impacted by a specific technical barrier to trade. The goods in the lists accounted for **17% of world trade** (USD 2.9 trillion) in 2020.

4 Carry out scoping analysis to **identify existing patterns** in environmental goods exports.

5 Identify HS6 codes of **high value** but that are **highly regulated**, to be used in a case study, ensuring their end-use meets multilateral environmental goals.

6 Carry out in-depth **case studies** on the impact of Technical Barriers to Trade on exporters and importers of these goods.

There is significant variation in the value of environmental goods exports across the globe



UK analysis suggests that the US, EU and China account for **48%** of the **value of environmental goods exports**.

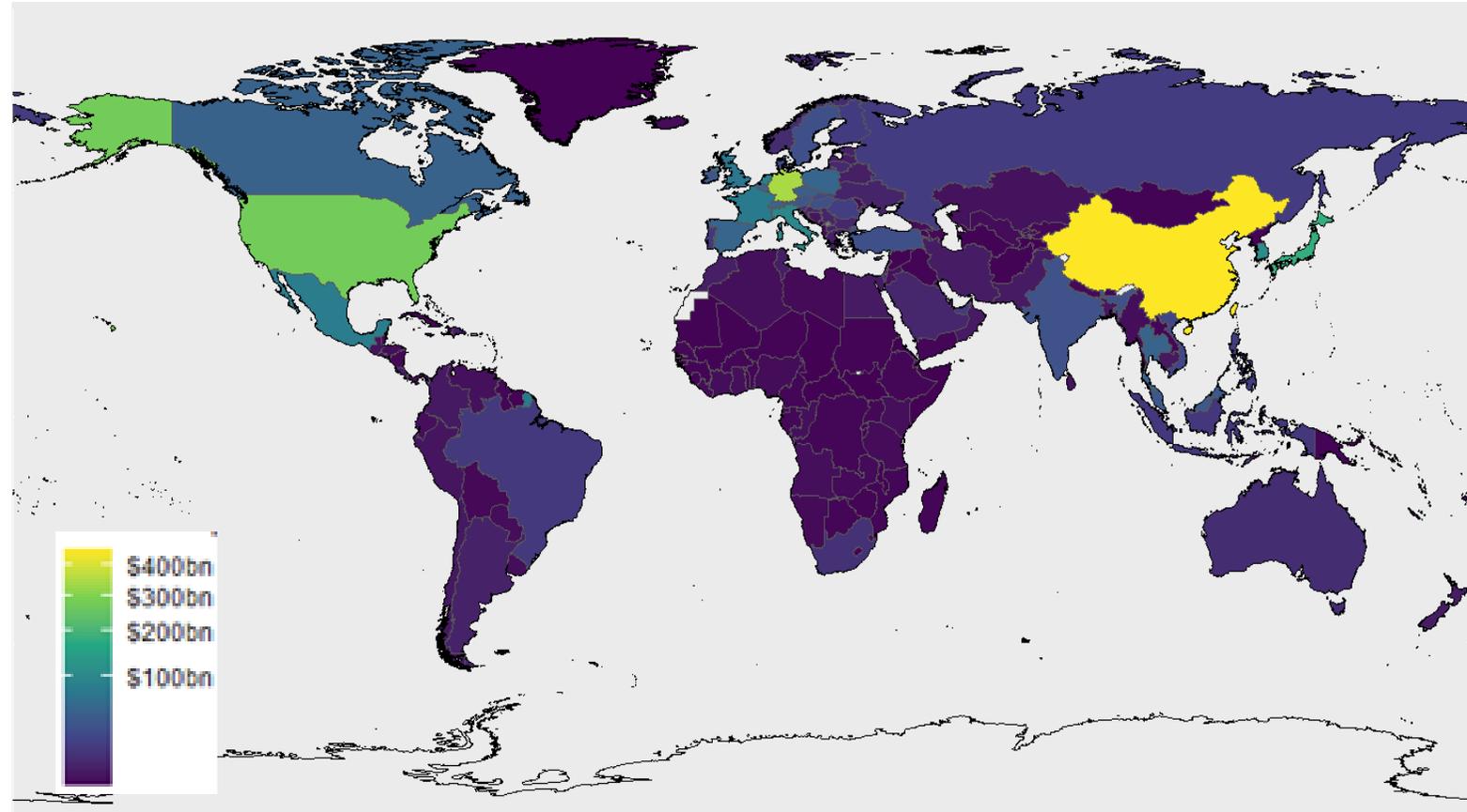
Graph 1 suggests African and South American countries, export **significantly fewer** environmental goods than more developed economies in North America and Europe.

The low value of environmental goods exports could be a product of **existing** global imbalances. However, UK analysis suggests that technical barriers to trade could be **exacerbating** these **imbalances**. In addition, just ten countries are responsible for **64%** of reported technical barriers to trade imposed on environmental goods.

When imposed by a **developed economy**, technical requirements can **help intensify existing trade** from other developed economies. However, they **reduce the ability of all other countries to export** as they cannot meet certain requirements (increase in intensive margins, decrease in extensive margins). This has **adverse impacts** on **developing economies**.

Therefore, we are keen to understand the **impact of technical barriers to trade on developing economies in particular** and where the **burden of certain technical requirements could be reduced**.

Graph 1: World map showing the value of environmental goods exports, for each country



There are a high number of globally applied technical requirements which result in barriers to trade



Technical requirements have impacts on **trade flows for all countries**. Our initial analysis found that globally applied technical requirements have resulted in **multiple economies** often imposing **similar but slightly different requirements** on the same **market**.

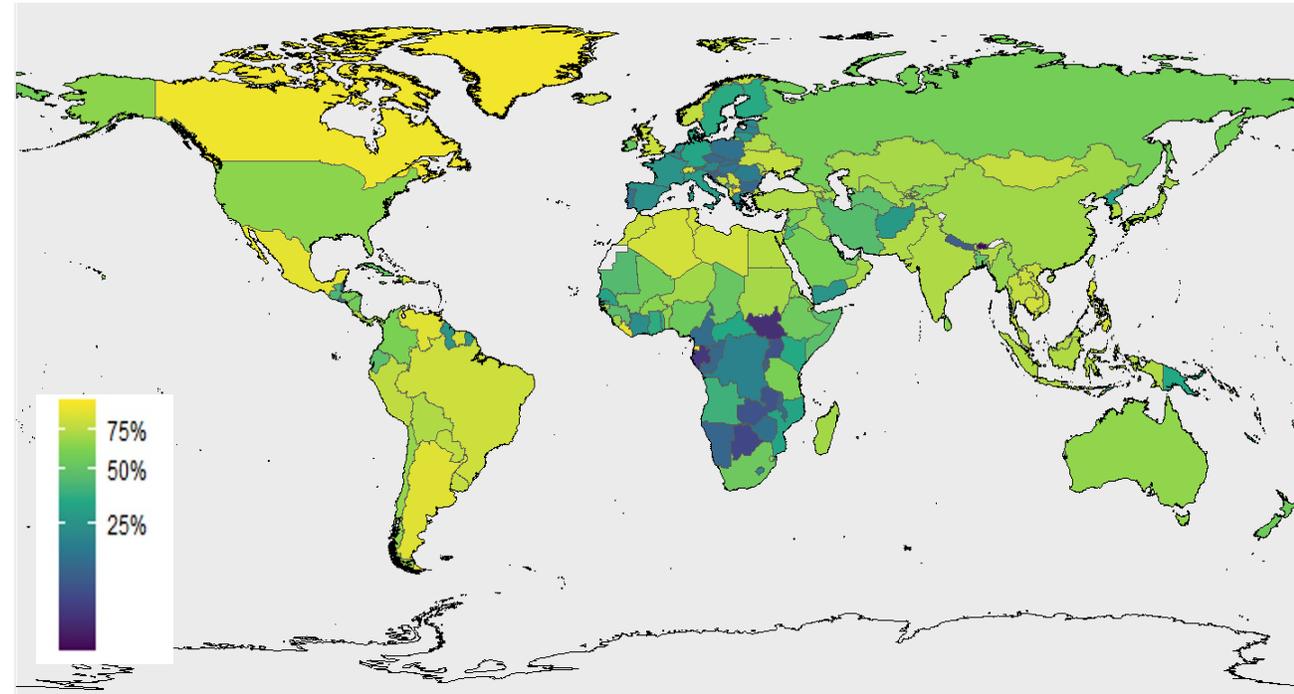
Meeting these requirements requires additional inputs of labour and capital, which has substantial implications on businesses as:

“a **1% increase** in investment to meet compliance costs in importing countries **raises variable production costs** by between **0.06% and 0.13%**”.

Therefore, we are investigating the **impact of technical requirement divergence** on trade flows in environmental goods and how TESSD members might be able to **reduce the impact** of TBTs through **harmonisation** of technical requirements as:

“clauses in regional trade agreements [can] substantially reduce the **price-raising effect of NTMs**, possibly reflecting lower compliance costs”.

Graph 2: World map showing the percentage of environmental goods exports, for each country, covered by TBTs



62% of environmental goods exports are impacted by technical barriers to trade.

*please note this graph includes intra-EU trade

- Bao, X. and Qiu, L.D. (2012) <https://datacatalog.worldbank.org/search/dataset/0038272>
- Anne-Célia Disdier Lionel Fontagné Olivier Cadot (...)
- Keith E. Maskus; Tsunehiro Otsuki; John S. Wilson (...)

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5 Identify HS6 codes of **high value** but that are **highly regulated**, to be used in a case study, ensuring their end-use meets multilateral environmental goals.

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Key challenges and solutions

Challenge: There is uncertainty surrounding the definition of an environmental good

- Created a dataset of HS6 codes based on several multilateral environmental goods lists.
- Undertook scoping analysis to identify key HS6 codes that were highly regulated but significant high value.
- Carried out in-depth analysis on case study examples, where the end-use of a certain HS6 code was in the production of renewable energy.
- Designed a methodology which could be used on different lists of environmental goods.

Challenge: The TRAINS dataset does not cover all countries and does not include import value

- UNCTAD has collected data on NTMs for 109 countries, so was the most comprehensive dataset available but does not cover all TBTs applied.
- Imported bilateral trade data from CEPII and mapped it across to our longlist of HS6 codes to create a new dataset.

Challenge: No sufficiently granular dataset on the causal impact of TBTs on trade

- The World Bank estimate AVEs of NTMs at a country and HS6 code level but don't distinguish between types of NTM.
- The use of literature to examine the ad-valorem equivalent of technical barriers to trade and cost implications of meeting requirements



Assumptions and Limitations

Data cleaning assumptions

- We have assumed that TBTs applied to HS2/4 codes affect all HS6 codes.
- All TBTs applied at HS7-10 level are counted as relevant to HS6 code (small fraction of TBTs).
- We have assumed that repeal dates are accurate for identifying currently applied TBTs (with no planned repeal date in the next few years).
- We made several assumptions about the structure of the TRAINS dataset when cleaning the commodity codes, which we confirmed through manual spot checks.
- If an HS code changes between 2012 and 2017 the TBTs applied to it in 2012 still apply.

Assumptions about technical barriers to trade and environmental goods

- Many environmental goods are dual-usage so we have selected case studies based on their end-use.
- If a technical requirement is applied to over 170 countries, we have assumed it to be a globally applied requirement.

Data and analytical limitations

- No data of the value of trade prohibited due to TBTs, just trade flows impacted.
- TRAINS does not include data for all countries.
- Data analysis does not account for size of the economy.
- For the first case study, “transition” economies are categorised as “developed” economies.
- TRAINS categorises the following economies as “transition” or “developed”: *Azerbaijan, Canada, European Union, Japan, Kazakhstan, New Zealand, Norway, Russia, Switzerland, United Kingdom and the United States.*



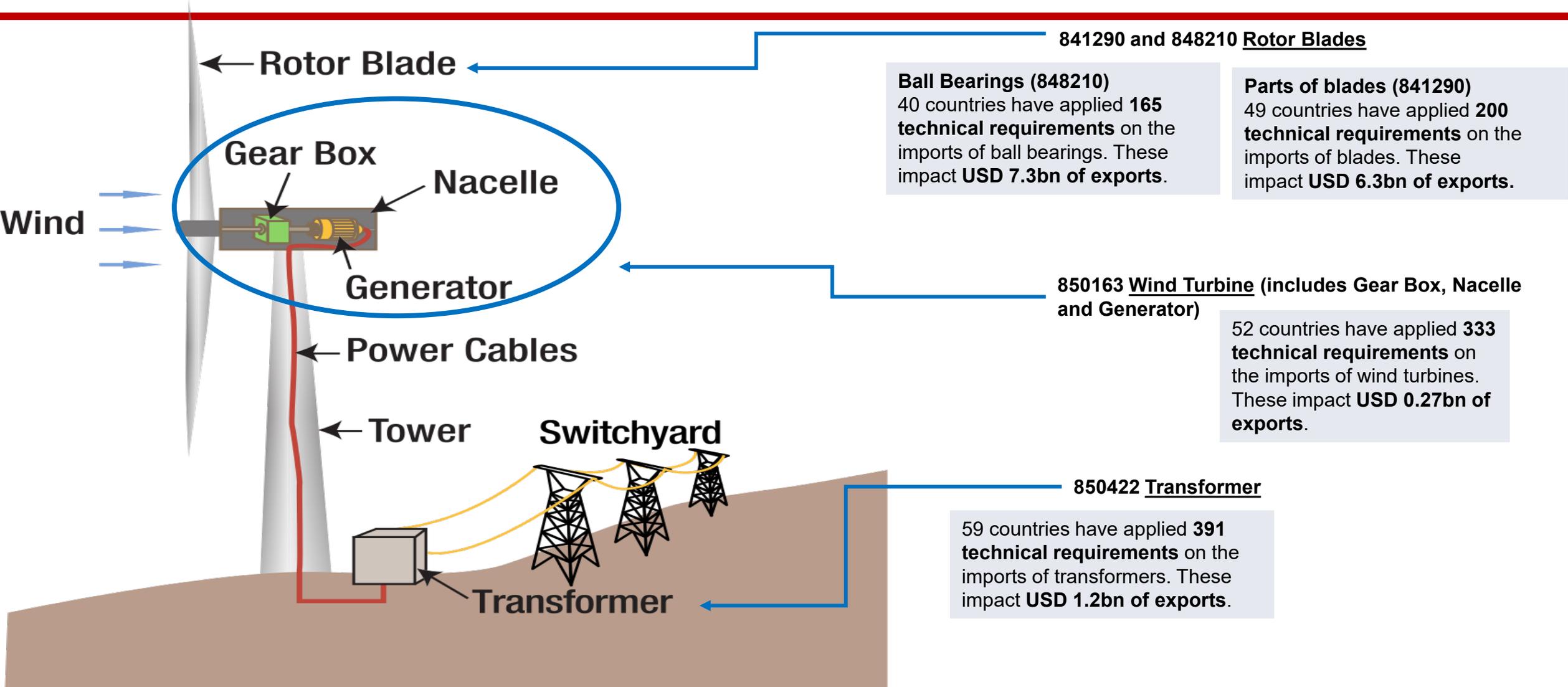
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Cluster One: Global imbalances in technical barriers to trade

Case study: Wind turbine components

Wind power is a cost-effective source of sustainable energy but wind turbine components are highly regulated



Technical requirements, when imposed by a more developed economy, can reduce the exports of less developed and emerging economies.



The literature indicates that, when applied by a **developed economy**, technical requirements **intensify existing trade** from other economies of similar development levels. However, they **reduce the ability of less developed economies to export**. Technical requirements imposed by **less developed economies** tend to have **no significant impact** on more developed economies.

USD 7.1bn (77%) of wind turbine component exports, from TRAINS-listed developing/emerging economies, are subject to technical requirements

On average, **USD 5bn** of wind turbine component exports, from TRAINS-listed developing economies, are subject to technical requirements applied by **developed economies, per year**.

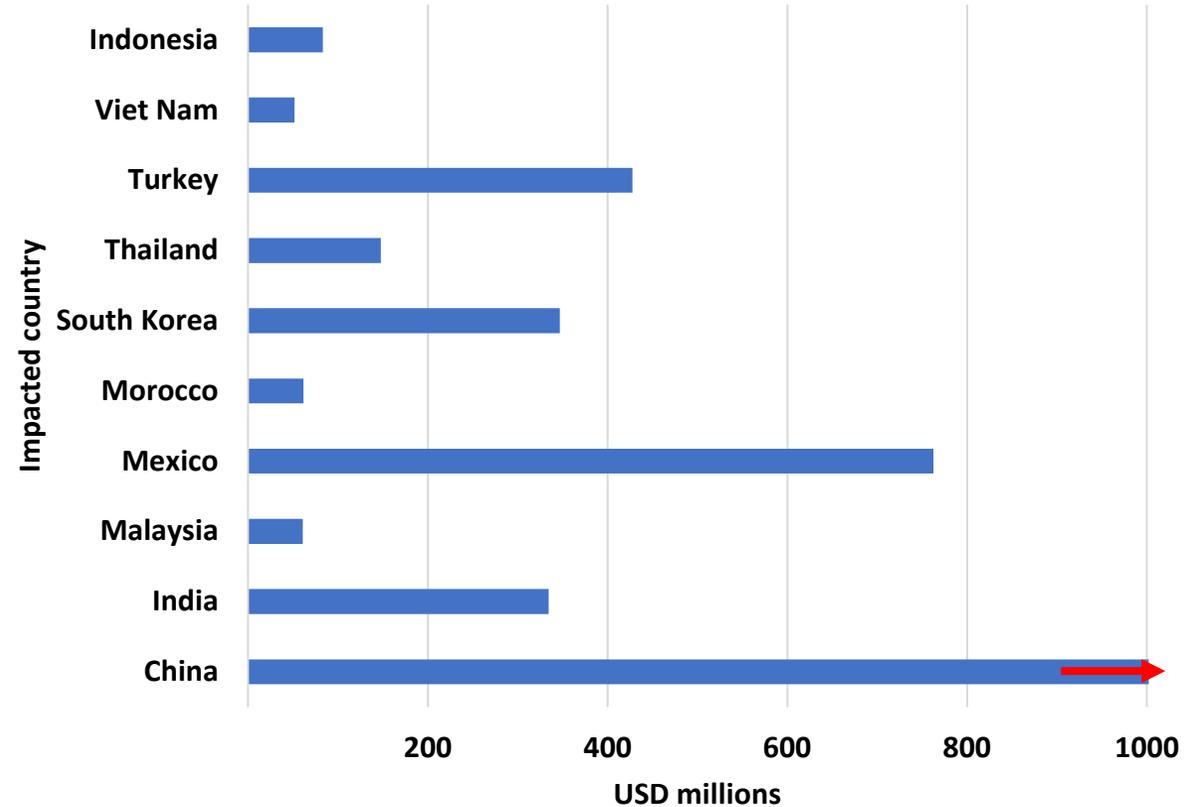
In addition, when imposed by **TRAINS-listed developing economies** by other **TRAINS-listed developing economies**, on average, **USD 2bn** of wind turbine component exports, per year, are subject to technical requirements

There are **252 requirements** imposed by **sixteen developed economies** and **487 requirements** imposed by **fifty-two developing economies** on the imports of wind turbines.

Only a **handful of developing economies** export a **significant value** of wind turbine components.

Collaboration between economies can make it **easier for more exporters to meet complex requirements**, as **technical barriers to trade** can have **more negative impacts** on the exports of **developing economies** and create **artificial comparative advantage**.

Graph 4: Value of wind turbine exports, impacted by TBTs, when imposed by a more developed economy



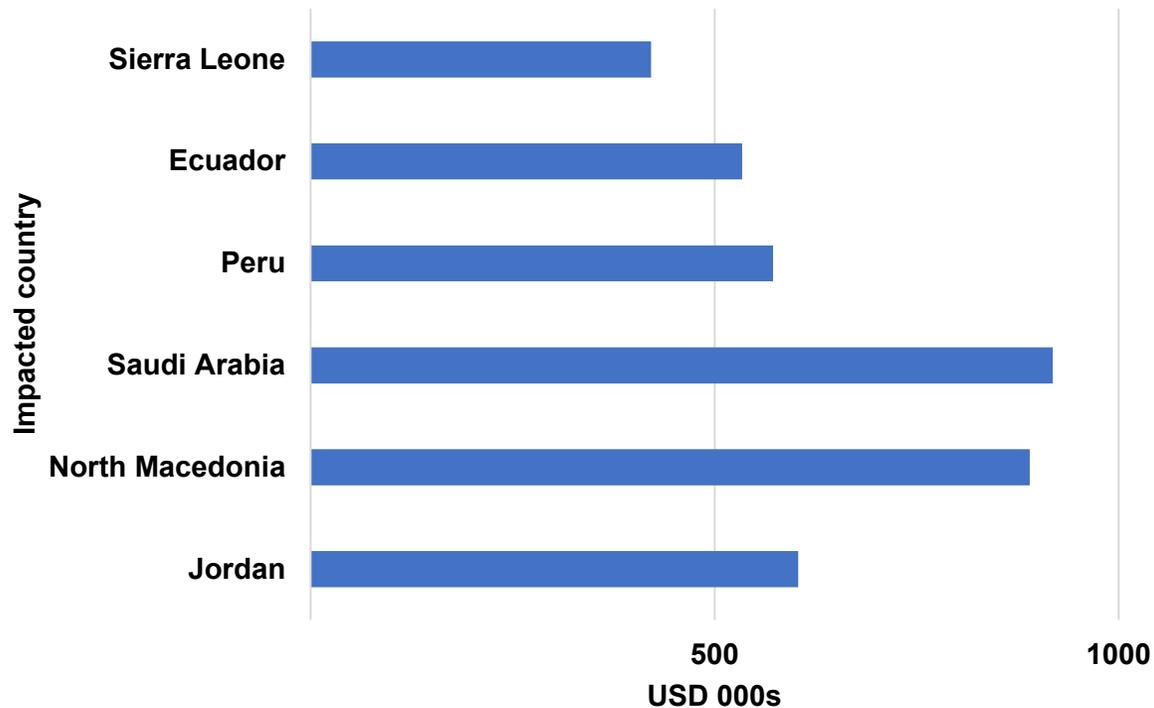


There is untapped potential within multiple developing economies

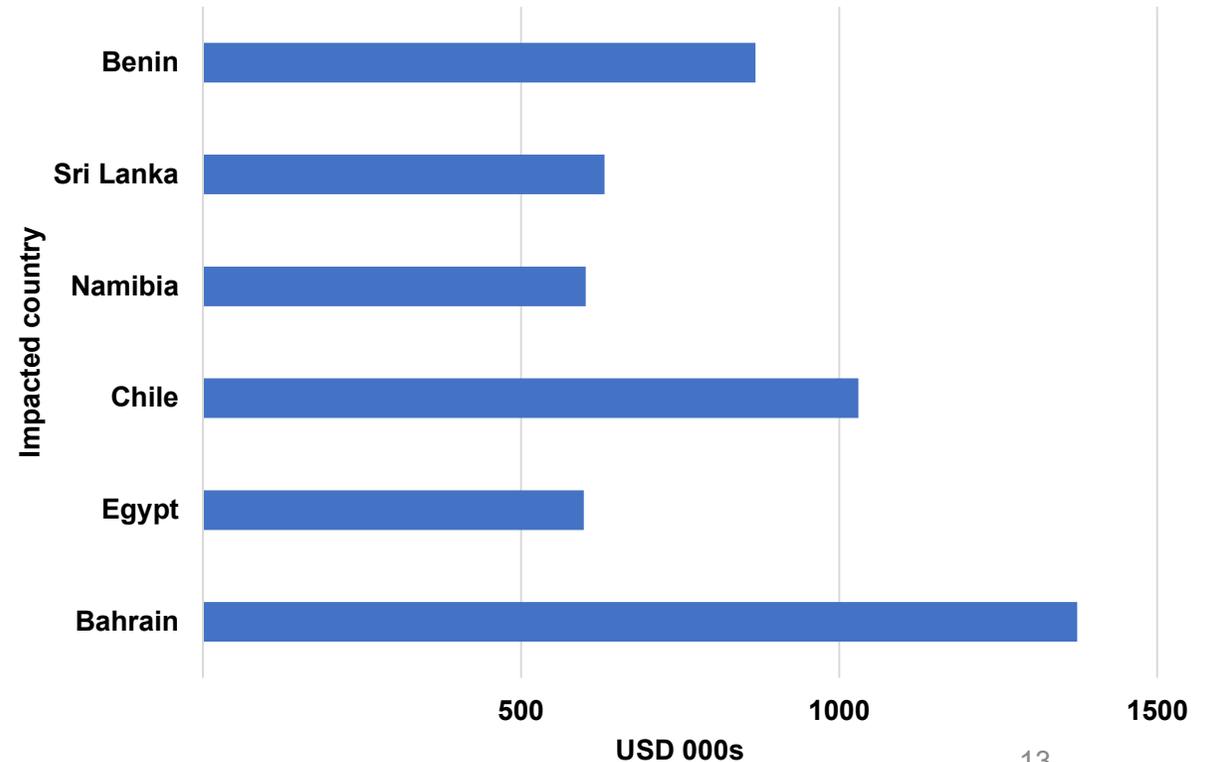
USD 1m worth of wind turbine component exports from other developing countries, such as Saudi Arabia and Chile, are subject to technical requirements.

There are, an additional, **135 developing economies** also subject to technical requirements on wind turbine components. The **lower value of exports** could suggest that these developing economies are **less able to meet certain requirements** imposed by more developed economies. Therefore, certain requirements **divert trade** away from developing economies, meaning there is **untapped potential** within **multiple other markets**.

Graph 5: Value of developing economy wind turbine exports impacted by TBTs when imposed by a developed economy (ranked 25th to 30th)



Graph 6: Value of developing economy wind turbine exports impacted by TBTs when imposed by a developing economy (ranked 25th to 30th)





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Cluster Two: Duplication, divergence and standardisation of Technical Requirements

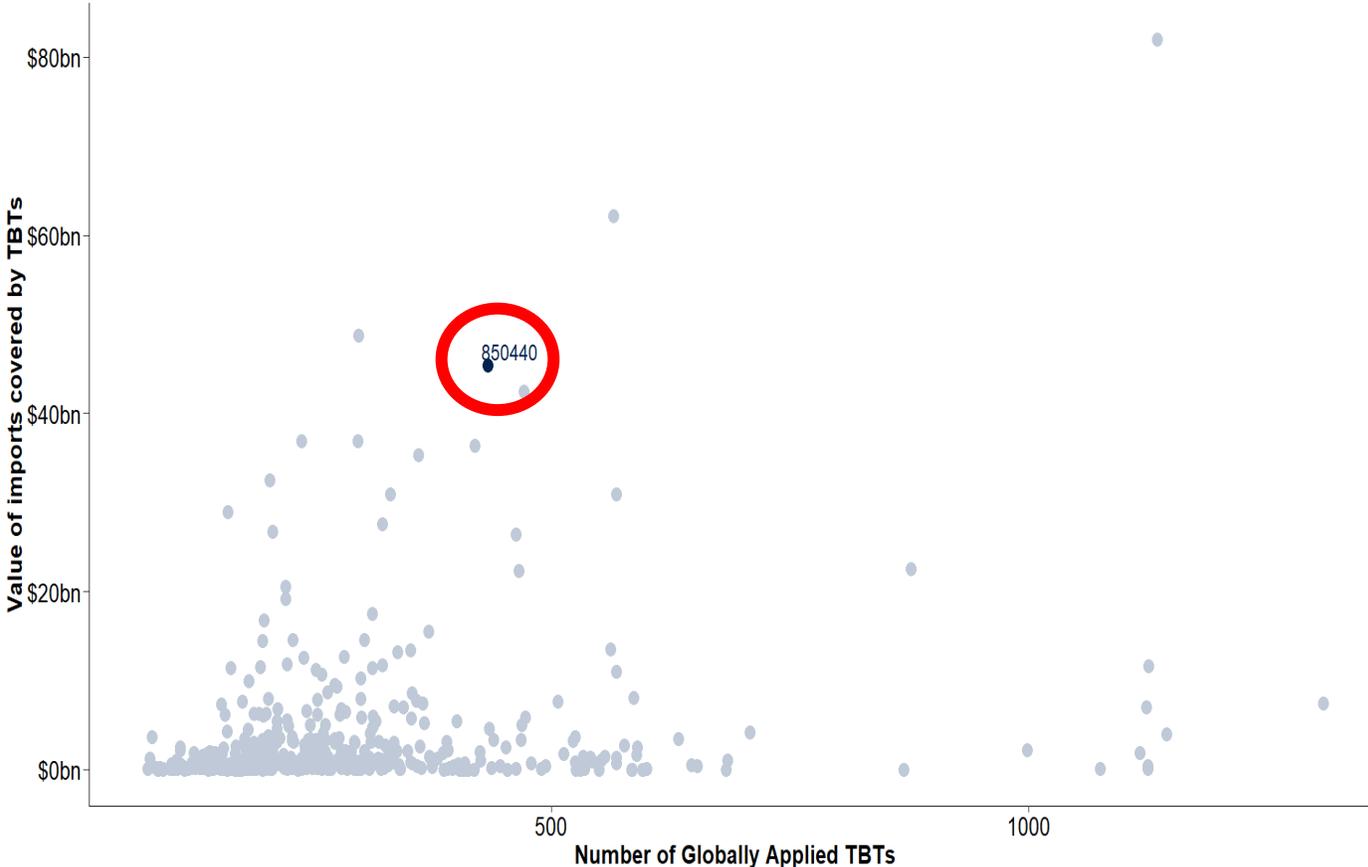
Case study: Static converters in solar panels

The number of TBTs on static converters suggests there could be scope for international regulatory cooperation or harmonisation



Graph 7: Average of 2018-2020 trade in environmental goods covered by TBTs against number of TBTs

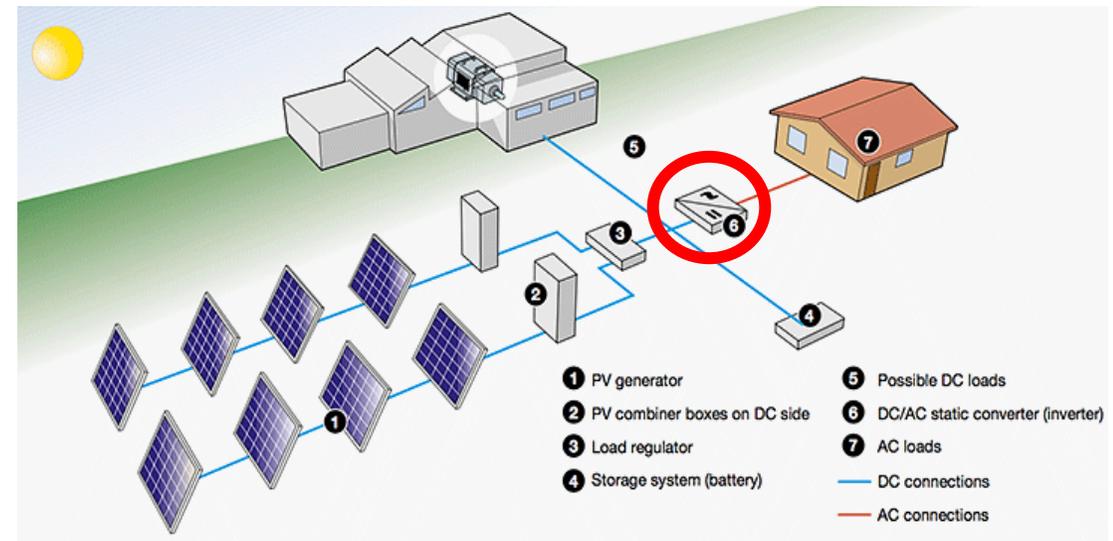
Average of 2018-2020 trade in environmental goods covered by TBTs against number of TBTs



Good Type ● Other ● Static Converter

Static Converters (850440)

- **USD 60bn** worth of **static converters** are exported, on average, per year (2018 to 2020).
- There are **multiple, highly regulated trade links** across both developed and developing economies.
- **Up to 45 TBTs** have been notified by a **single country** on the imports of static converters

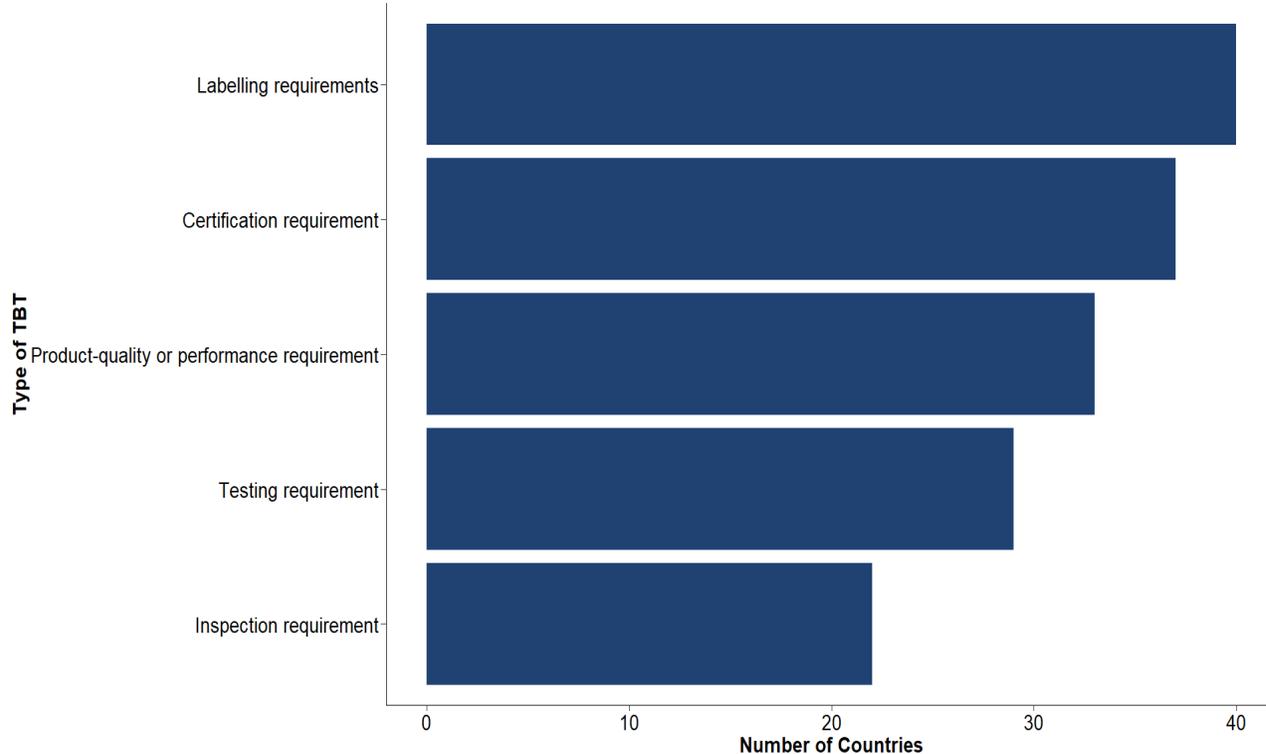


There is scope for additional harmonisation of requirements



Graph 8: Number of countries implementing different types of TBTs on static converters

Types of TBTs implemented on static converters by the most countries



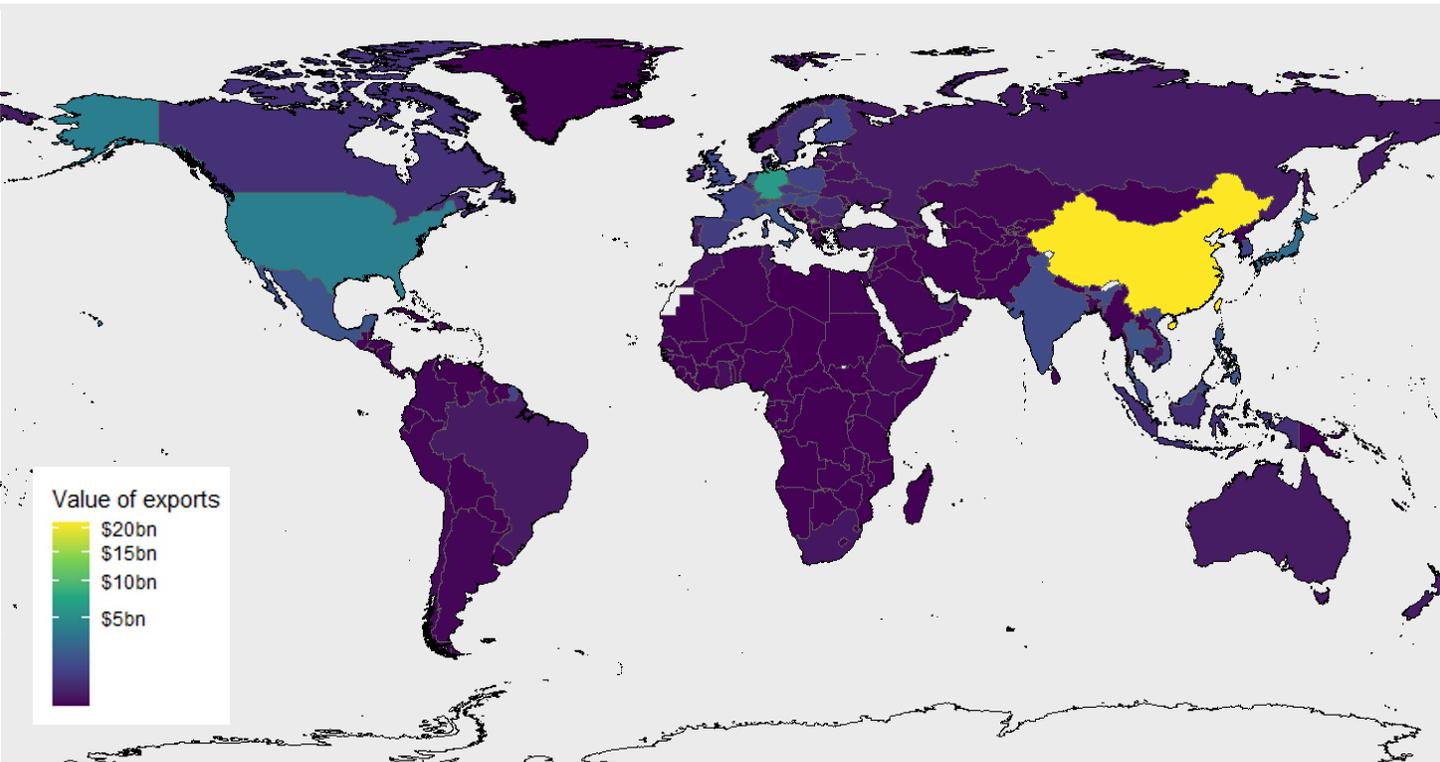
Graph 8 shows how over 30 different countries impose a requirement on product-quality or performance, certification and labelling requirements.

- The number of TBTs which apply to global imports suggests that countries are making a significant effort to implement **international standards**
- However, there are **523 TBTs implemented** on the imports of static converters, **by 61 different countries**, globally.
- UK analysis suggests that exporters face duplicative requirements, with **multiple economies** imposing **similar but different requirements** on a given **country's exports** (suggesting regulatory divergence).
- Therefore, if countries want to promote trade in environmental goods, there is scope for **greater cooperation** on technical requirements.



However, regional standards can reduce exports from other countries

Graph 9: World map showing the value of static converter exports, for each country



NB: Additional investigation is required to assess where international standards are present and where regulations are based on international standards.

The value of exports in static converters is greatest in North America, South East Asia and Europe. These regions apply a **high number of technical requirements on static converters.**

Regional technical requirements and standards can help **facilitate trade and increase export volumes** between markets in that region.

However, they can **create barriers** to the exports of **developing countries**, as they further **restrict their export capability.**

This **decreases the number of trading relationships** in static converters.

This may have impacts on both the **quality** and **quantity** of static converters being imported.

Collaboration between **TESSD members** on technical requirements and standards can help **facilitate global trade in environmental goods.**

Summary of findings



To summarise, we found that:



Technical barriers to trade **decrease trade in environmental goods**, but have **varying impacts**, depending on the **exporting and importing countries**.



There are **incidences of duplication / divergence**, with **multiple economies** imposing the **same type of technical requirement (but slightly differently)** on the **same HS6 codes for a country's exports**.



High regulation reduces the number and diversification of trade flows in environmental goods. Improving upon existing developing country assistance to meet certain standards, or wider regulatory cooperation, could help realise untapped potential in multiple markets.



Levelling the playing field:

- Potential future workstreams looking at TBTs and global imbalances, specifically where developed economies may be able to assist developing economies and improve export market accessibility



Regulatory cooperation:

- Carry out an in-depth assessment of duplicative requirements and examine where there is potential for standard-setting or harmonisation, minimising regional-bias where possible



Additional qualitative and quantitative research:

- Undertake a comprehensive business engagement exercise to better understand the direct impact of technical barriers to trade and where intervention is required
- Carry out additional analysis to ascertain which, less established exporters, hold a comparative advantage and are impacted by technical barriers to trade



Data improvements:

- Discuss the need for business-level data, on the value of exports prevented by TBTs, and work with the WTO to utilise their data collection capacity



Consolidation of existing research:

- Other workstreams on non-tariff barriers to environmental goods, are already underway e.g. WEF and APEC, which should be used to facilitate wider collaboration

References



Literature

Cadot, O., J. Gourdon and F. van Tongeren (2018-05-16), “Estimating Ad Valorem Equivalents of Non-Tariff Measures: Combining Price-Based and Quantity-Based Approaches”, *OECD Trade Policy Papers*, No. 215, OECD Publishing, Paris.

<http://dx.doi.org/10.1787/f3cd5bdc-en>

Bao, X. and Qiu, L.D. (2012) ‘How Do Technical Barriers to Trade Influence Trade?’, *Review of international economics*, 20(4), pp. 691–706.
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North-South Standards Harmonization and International Trade. Anne-Célia Disdier, Lionel Fontagné and Olivier Cadot
Forthcoming *World Bank Economic Review*

The Cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study

Keith E. Maskus, University of Colorado at Boulder; Tsunehiro Otsuki, Osaka University and John S. Wilson, World Bank
CEPII Working paper NTMs, Preferential Trade Agreements, and Prices: New Evidence Olivier Cadot & Julien Gourdon

Data Sources

- TRAINS Database of Non-Tariff Measures (<https://trainsonline.unctad.org/home>)
- Product-level bilateral trade flows (http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=37)
- Ad Valorem Equivalents of Non-Tariff Measures (<https://datacatalog.worldbank.org/search/dataset/0040437>)

Environmental Goods Lists

- [WTO list](#) of submissions on environmental goods
- [OECD list](#) of environmental goods
- [APEC list](#) of environmental goods
- [UNEP list](#) of environmentally sound technologies