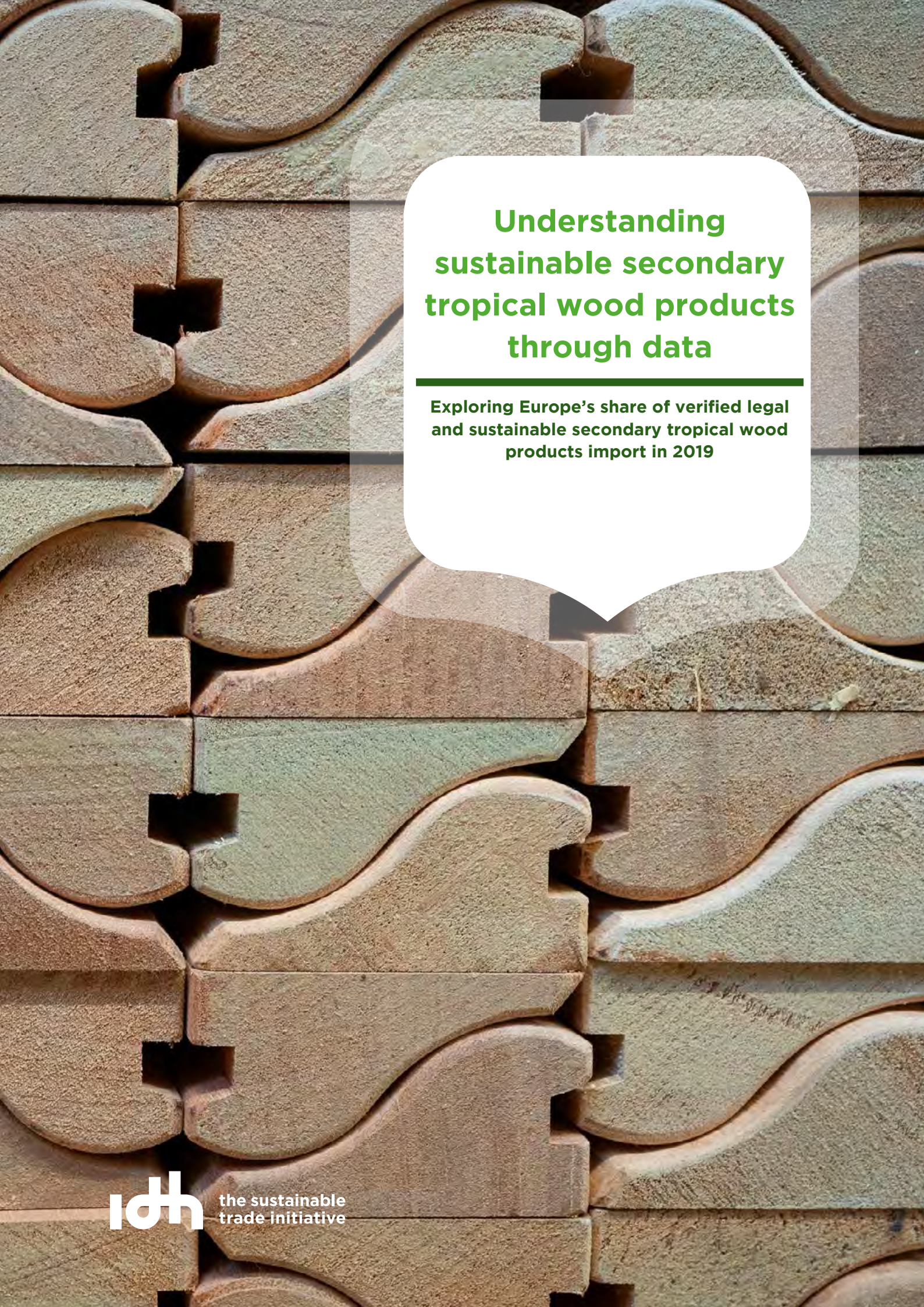

Understanding sustainable secondary tropical wood products through data

Exploring Europe's share of verified legal and sustainable secondary tropical wood products import in 2019

the sustainable trade initiative

Colophon

Global Timber Forum (GTF) builds the capability of forest and wood-based industry associations to engage small and medium sized member companies on responsible trade. GTF has an existing global network of associations and stakeholders with experience in trade data and market research along with stakeholder engagement and communications expertise.

Stichting Probos is a leading not-for-profit Dutch knowledge institute committed to promoting sustainable forest management. Probos has over 50 years experience in timber market and wood flow research and believes that all policy and strategies should be based on reliable data. Probos works for and with governments, the private sector, and non-governmental organizations.

We would like to thank the following individuals and organizations for their participation in this study:

- IDH, the Sustainable Trade Initiative
- The STTC Technical Committee:
  - PEFC International
  - FSC International and many of their National Offices
  - ATIBT, the International Tropical Timber Technical Association
  - AEIM (Spanish Timber Trade Federation)
  - Le Commerce du Bois (LCdB)
  - The European Timber Trade Federation (ETTF)
- ATIBT and their producer members in the Congo Basin
- Associação Brasileira da Indústria de Madeira Processada Mecanicamente (ABIMCI)
- Asociación de Exportadores Peru (ADEX)
- Union des Forestiers et Industriels du Gabon (UFIGA)
- FLEGT Independent Market Monitor (IMM)
- The Borneo Initiative (TBI)
- UK Timber Trade Federation (TTF)
- Corporate and Association interviewees in Belgium, France, Germany, Italy, Spain, and the UK
- The interviewers: Robin Fisher; Alberto Romero (AEIM); Nicola Andrighetto (ETIFOR); Gunther Hentschel
- National offices of both FSC and PEFC who responded to our survey
- Those companies who responded to our survey in these challenging times.

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Commissioned by:
IDH, the Sustainable Trade Initiative
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October, 2020

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Design: Tegenwind and MaiDesign

*Note that participation does not necessarily imply endorsement of the results of this study by the listed organizations

Understanding sustainable secondary tropical wood products through data

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the sustainable trade initiative

growing responsible trade

probos

STTC
EUROPEAN SUSTAINABLE TROPICAL TIMBER COALITION

Photo Mark van Benthem, Probos

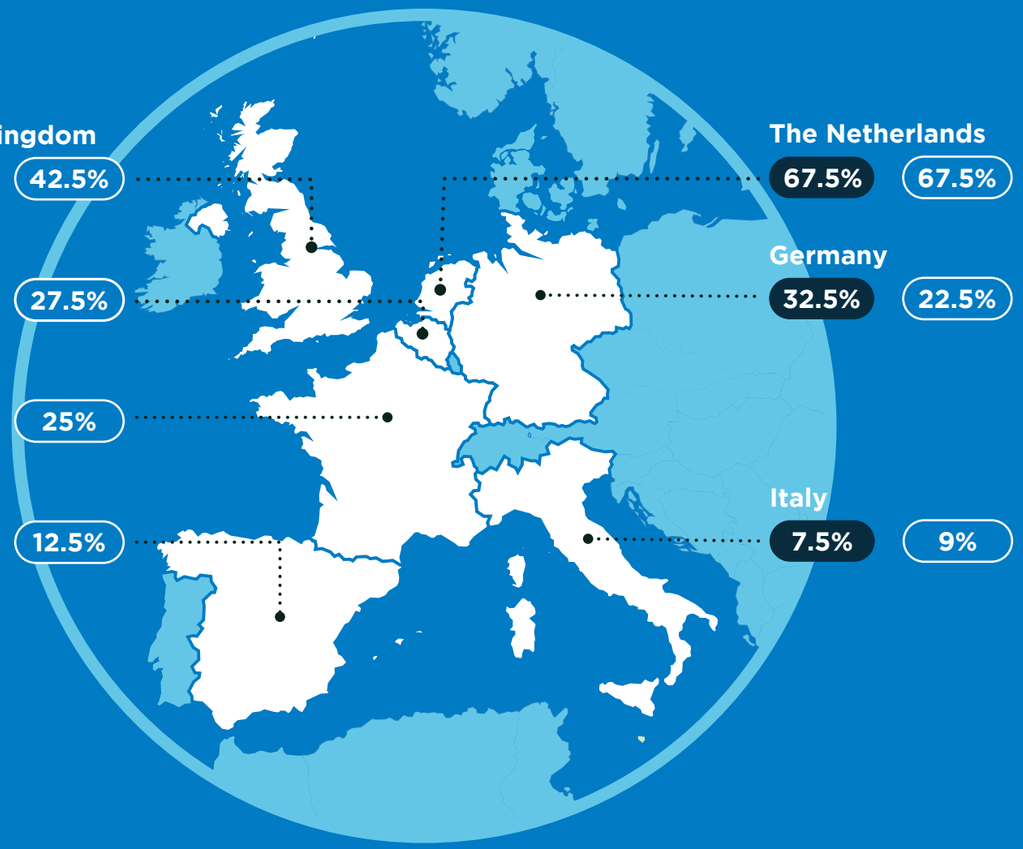
Table of contents

SOURCING VERIFIED SUSTAINABLE TROPICAL TIMBER IN EUROPE

28.5% primary[1] and **33%** secondary[2]
of tropical timber product direct import is exposed to certification[3]

Primary products (2018)
Total import: 1,473,000 MT

Secondary products (2019)
Total import: 187,500 MT



FLEGT-licensed imports account for 11% **and** 42%

Achieve sustainable tropical timber sourcing via

- Procurement policies and sourcing commitments
- Partnership with key supplier countries and emerging economies
- Enhancing EUTR enforcement
- Expanding sustainable tropical timber application
- Improving information transparency and monitoring
- Greater synergies between FLEGT and certification

If Europe source 100% sustainably

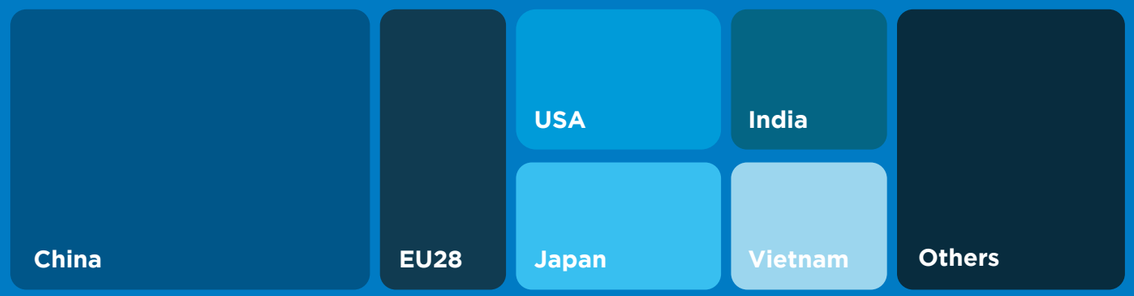
18
million ha

of tropical forest could be positively impacted

100
million tons CO_2

annually could be potentially mitigated

Key global primary tropical timber importers[4]



1 Primary products include: logs, sawnwood, veneer and plywood
2 Secondary products include external and internal doors, door frames and thresholds, wood mouldings, builders' joinery and carpentry, and wood window frames.
3 All % are mid-range of estimated range of exposure to certification. Source: GTF and Probos
4 Data shown in value. Source: ITTO Biennial review statistics - www.itto.int/biennal_review

Executive summary

This report explores the impact of the EU 27 + UK's imports of certified tropical wood products on forests in producing countries. Certified tropical wood imports guarantee Sustainable Forest Management (SFM) practices, preserving the world's tropical forests, mitigating climate change, and ensuring sustainable livelihoods for communities near forest areas. Tropical wood enters the EU27 + UK as primary products like roundwood and sawnwood and secondary products like windows and doors. This report builds upon the 2019 IDH publication *Unlocking sustainable tropical timber market growth through data* (which focused only on primary tropical wood products), breaking a new ground to examine the impacts of EU27 + UK imports of four secondary tropical wood products (doors, mouldings, other joinery, and windows).[1]

COVID-19 looms over the publication of this report, impacting data collection, and creating uncertainty for the future. The true effects of COVID-19 on the tropical timber industry remain unknown, but projections show euro-area GDP plunging by over 9%. A recent FAO study indicates that 68% of 150 global companies, government agencies, associations, and NGOs that responded were "*extremely or very concerned*" about the impacts of COVID-19 on their business or operations. Almost a million forest and timber processing sector workers have been directly affected in eight of the main tropical wood producing/processing countries, and construction and processing in other large countries will surely be affected. Future studies will reveal the true effects of COVID-19 on tropical timber.

Much like the 2019 report on primary tropical timber products, this report uses exposure to certification to reveal the source of EU27 + UK secondary tropical timber imports. Importantly it only calculates direct imports from producing countries and does not account for EU27 + UK intra-trade – consumption data may vary greatly from the import data. The exposure to certification method considers the share of FSC and PEFC certified forests as a percent of total productive forest area in producing countries, and projects this onto the export data of the ITTO producer countries. Exposure to FSC and PEFC certification is the primary focus, but where possible analysis of FLEGT Licensed materials (from Indonesia) and verified legality schemes are included. As with the 2019 report a process of validation was applied to provide a reality check based on input from across a range of key markets.

The data shows that just five countries – France, Netherlands, Germany, Belgium, and the United Kingdom (in order of scale of imports) – are responsible for 90% of EU27 + UK imports of secondary tropical wood products. The Netherlands is the largest importer of secondary tropical wood products exposed to certification in the EU27 + UK, followed by France, Belgium, Germany, the United Kingdom, Italy, and Spain. Indonesia (79,400 tonnes) and Brazil (65,300 tonnes) are responsible for over three-quarters (77%) of the total EU27 + UK imports of selected secondary tropical wood products. Indonesia is by far the largest supplier of secondary tropical wood products – 76% of EU27 + UK imports imports exposed to certification.

The analysis concludes that in 2019, 29%–37% of EU27 + UK direct imports of the selected secondary tropical wood products were exposed to certification. Secondary tropical wood products largely parallel the 2018 data on primary tropical wood products — 25–32% of primary tropical wood products were certified in 2018. Volumes of secondary tropical wood product imports (187,500 tonnes in 2019) are far less than primary tropical wood (1,473,000 tonnes in 2018), but the potential impacts are still significant. Current EU27 + UK demand for certified secondary tropical wood products positively impacts at least 763,000–925,000 hectares of tropical forests. Ramping up demand for SFM-certified products to 100% of imports would impact an additional 1,160,000–1,322,000 hectares of tropical forests. **The total potential impact of the combined primary and secondary tropical wood product markets is enormous – positively impacting over 18 million hectares if 100% sustainable.**

The new data show that the current demand of the EU27+UK for certified tropical timber primary and secondary products reduces CO_2 emissions per year by between 18.9 and 29.2 million metric tons. A EU27+UK market using only sustainable tropical timber products might reduce emissions by almost 100 million metric tons.

Creating this impact will require growing demand for sustainable tropical products in the EU27 + UK, and expanding use-cases for and interest in tropical timber generally. EU27 + UK governments have an important role to play growing and enforcing EUTR, altering procurement policies, working with governments in producing countries and emerging markets, and collaborating with non-profits to explore synergies. All market actors must work to grow the market, expand applications for tropical timber, and improve transparency to aid reports like this one in order to realize a world in which the world's life-giving forests are maintained in perpetuity.

Photo Weekamp Deuren

Preface

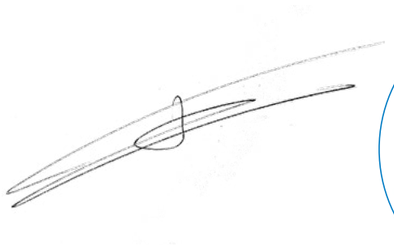
The past year has been challenging for the entire world. The impacts of the COVID-19 pandemic on forests and forestry include disrupted business and value chains, lost income, and the disappearance of jobs. The risks of increased deforestation and natural resource degradation persist despite this crisis, and the importance of the forestry and forest-based sector's efforts to solve this problem remains undiminished. Upholding commitments to legal and sustainable use of forest resources is the bedrock of Sustainable Forest Management (SFM), and necessary to protect the livelihoods of communities near forests, meet the long-term demand for forest products, ensure the resilience of crucial ecosystems, and sequester carbon to mitigate climate change.

The IDH Tropical Timber Program has promoted the use of sustainable tropical timber for over a decade, including convening the European Sustainable Tropical Timber Coalition (STTC) in 2014. In partnership with key allies including the European Timber Trade Federation (ETTF), ATIBT (Association Technique Internationale des Bois Tropicaux), FSC, and PEFC, we aim to accelerate European market demand for SFM timber products, and incentivize responsible forest management in tropical countries. Though other actors increasingly dominate timber markets, European demand still plays a crucial role in driving SFM practices worldwide.

The publication of sustainable tropical timber monitoring studies is central to driving change in market actors. These reports provide information, transparency, accountability, and act as a benchmark to understand Europe's current role in promoting SFM in the tropics. They serve as a roadmap to increase and strengthen impacts. Only by fully understanding the EU tropical timber market can we begin to leverage our power to transform forestry practices throughout the world. Through the process of data collection, we also aim to strengthen the relations among key stakeholders and data providers to increase coverage and confidence for future studies, and align the sector to better harness resources and expertise.

In this third report, we broaden the analysis of the EU tropical timber market from primary products to a selected group of secondary timber products: doors, mouldings, other joinery, and windows. In line with the previous report, a refined exposure to certification methodology coupled with expert surveys is employed to best estimate the impacts of the EU27 + UK's imports of the selected secondary timber products. The results of this report (covering 2019 data on secondary products) and last year's report (covering 2018 data on primary products), reveal a lack of progress towards sustainability in EU27 + UK markets.

After the report was completed in the summer of 2020, towards the end of the year, several sources have reflected upon the unexpected resilience of the tropical timber market under the global crisis. The world needs Sustainable Forest Management more than ever. Europe must take the lead and build partnerships to enhance the forest sector's shift towards sustainability. A growing European market for sustainable timber can foster sustainable forest practice across the world, and a more resilient and sustainable society and environment globally. We urge European governments, companies, and NGOs to promote, commit, and act to reach 100% verified sustainable tropical timber imports.



Daan Wensing
CEO, IDH The Sustainable Trade Initiative

Photo Mark van Benthem, Probos

1 Introduction

Rooted in the understanding that Sustainable Forest Management (SFM) can prevent forest degradation, support the communities impacted by forestry, and sequester carbon, this report explores the impacts of the EU27 + UK's imports of a selection of secondary tropical wood products. It builds upon the 2019 IDH publication – *Unlocking sustainable tropical timber market growth through data* – to reveal the complete impact of EU 27 + UK timber imports and drive uptake of sustainable imports.[2]

Unsustainable timber production and harvesting practices pose threats to tropical ecosystems and catalyze the destruction and conversion of forest lands. SFM generally requires careful assesment of forests, planning to minimize impact in all aspects of logging, harvesting on an ecological timescale, and constant monitoring to maintain best practices. SFM is promoted primarily through two avenues: strong governance in producer countries, and certification schemes. The EU currently promotes SFM through the FLEGT Action Plan (strengthening governance to preserve forests), but for the most part enforcement is still insufficent in developing countries. Certification via voluntary schemes like FSC and PEFC are currently the most measureable way to guarantee SFM, and certification rates are used as a proxy for SFM timber in this study.

The 2019 report primarily assessed the impacts and markets for primary tropical wood products such as logs, sawn wood, and plywood over 2018. This study draws upon the analysis and findings of the previous reports and extends the scope to cover four selected tropical wood products — external and internal doors, door frames and thresholds, wood mouldings, builders' joinery and carpentry, and wood window frames.

We analyze these secondary tropical timber products using 2019 trade data on the EU27 + UK markets and certification rates in producing countries to estimate the rate of certification in EU27 + UK tropical timber imports and the associated benefits to producer countries including potentially avoided deforestation. The result is a best estimate of the impacts of Europe's imports on preservation of forests. It's clear that the EU and its individual member states have an outsized ability to affect sustainable timber worldwide, and growing sustainable imports has the potential to reduce deforestation and promote SFM throughout the globe.

1.1 Summary of the 2019 analysis

Previous studies seeking to estimate the market impact of verified legal and sustainable timber have solely concentrated on primary timber products such as sawnwood and plywood. Value-added secondary products constitute around 40% of the tropical timber market and are relevant to the links between the EU27 + UK and deforestation in producing countries.[3]

The 2019 *Unlocking sustainable tropical timber market growth through data* report concluded that EU market demand for verified legal and sustainable tropical timber directly impacts land-use in the tropics.[4] Building upon the 2016 IDH report '*How Sustainable are Europe's Tropical Timber Imports?*' it explored the verified timber market and how an EU commitment to 100% verified sustainable primary tropical timber could contribute to deforestation-free supply chains and help meet climate change mitigation targets.[5] The 2019 report also considered FLEGT Licensing and used data from Indonesia (the only operational FLEGT country) to demonstrate the significance of improved governance.

The 2019 report methodology employed a proxy for market share – the *exposure to certification* method – that considered the share of certified forests compared to the total forest area in the producer country, and then projected this share onto the export data of the producer country in question. The report results indicated that in 2018 the EU28 imported 1,473,000 tonnes of primary tropical timber products, of which 1,258,000 tonnes come directly from International Tropical Timber Organization (ITTO) producer countries (12% of total ITTO exports).[6] Most of Europe's imports were from Africa (56%), followed by Asia (25%), and Latin America (19%). Overall imports from the main producers have fallen from 2.7 million tonnes in 2008 to around 1.3 million tonnes in 2018 as a result of economic recession, negative consumer sentiment towards tropical timber, competition from other materials, shortage of supply, the introduction of EUTR, and increasing prefabrication (2018 shows a modest recovery).[7]

Analysis estimated that 25%–32% of primary tropical timber products imported into the EU28 were exposed to certification.[8] In 2018 seven main EU tropical timber importing countries represented approximately 90% of the EU28 primary tropical timber product import: Belgium (25%-30% certified imports), France (10%–15%), Netherlands (65%–70%), Italy (5%–10%), United Kingdom (40%–45%), Germany (30%–35%), and Spain (2.5%–7.5%).

The report projected the above percentages onto forest areas and demonstrated that the 2018 demand for certified primary tropical timber products of the EU28 positively impacted 2.7–4.4 million hectares of semi-natural and natural tropical forest. If the EU28 had sourced 100% verified sustainable primary tropical timber products it could have positively impacted 16 million hectares of semi-natural and natural tropical forests.

Models assuming that certification will prevent premature reentry logging in the areas it covers, show that EU certified tropical timber has the potential to mitigate 55 to 88 million tonnes CO_2 per year.

1.2 The impact of COVID-19

The COVID-19 pandemic has triggered the most severe recession in nearly a century and is causing enormous damage to people's health, jobs, and wellbeing, according to the OECD's *Economic Outlook*.[9] This report was envisaged prior to the COVID-19 pandemic and much of the work to collate data and interview people was undertaken during the first six months of the outbreak. During this period a third of the world population was on some form of a coronavirus `lockdown."[10] With many businesses and their supply chains facing severe and ongoing restrictions to travel, the process of gathering information through meetings was hampered. The challenge of gathering data and insight from companies and trade associations at the current time illustrates the problem very well – many reported facing existential threats to their business or association and were hard pressed to find time to comment.

For the forest industry, trading partners, and communities they work in and rely on the story is the same – lockdown, exit, and hopefully a recovery. As restrictions begin to ease, the path to economic recovery remains highly uncertain and vulnerable to a second wave of infections. The containment measures enacted by most governments' were necessary to slow the spread of the virus and limit the death toll, but they have also closed down business activity in many sectors and caused widespread economic hardship.

The economic impact of strict and relatively lengthy lockdowns in Europe will be particularly harsh. Euro area GDP is expected to plunge by over 9% even if a second hit is avoided, while GDP in the United States will take a hit of 8.5% and Japan 7.3%. Meanwhile emerging economies such as Brazil, Russia, and South Africa face strained health systems, adding to the difficulties caused by a collapse in commodity prices, and their economies plunging by 7% to 10%. India's GDP will be relatively less affected with a decrease of around 3.7%. China perhaps offers some hope — it reported that GDP growth in the second quarter was at 3.2%.[11] The figure is higher than experts were predicting and points towards a V-shaped recovery — a sharp fall followed by a quick recovery.[12] It is possible that with pent-up consumer demand there will be a quicker rebound than after previous crises (such as in 2008). However, consumers may change spending behavior to minimize social interaction, and uncertainty can lead households to save more.

It is too early to tell what the impact has been or will be upon the global timber industry as a whole, and the tropical timber industry especially. Early indications were that the impact was profound where it was measured, though more recent market reports suggest that EU imports of tropical wood may not be as severely affected as at first feared. Table 1 shows that almost a million forest and timber processing sector workers have been directly affected in eight of the main tropical wood producing/processing countries. The number of impacted workers in the wood processing and construction sectors across the EU, US, China, and India is also likely high.

Photo Mark van Benthem, Probos

Table 1 Estimated number of workers laid-off or made redundant due to temporary or permanent closure[13]

Country	April	May	June	Note
Malaysia			105,000	Estimated figure based on FAO statistics where "50% of work force laid off"
Indonesia	280,00			
Myanmar		50,000		
India		90,000		Mid estimate
Viet Nam	21,410	112,950		Estimated figure for May based on FAO statistics where "45% of factories were closed in April / May"
Brazil		260,000		
Gabon			16,000	Estimated figure based on FAO statistics where "50% of work force laid off"
Cameroon			11,000	Estimated figure based on FAO statistics where "73% of work force laid off"
Totals	**301,410**	**512,950**	**132,000**	**3 month total: 946,360**

Initial studies and reports on the impact on the forestry and wood processing sectors have begun to highlight the scale of the impact.[14] FAO's study indicates that 68% of 150 global companies, government agencies, associations, and NGOs that responded were "*extremely or very concerned*" about the impacts on their business or operations. Trade associations in Gabon, Brazil, and Malaysia have all reported that the depth, longevity, and true impacts are still *unknown* and that a return to normality may take months or even years.

By some measures forestry and harvesting of timber have been little impacted in terms of lockdown restrictions. Harvesting has continued after a brief break in most producer countries. Closure of mills and manufacturing plants started in China in February and March 2020 before the phenomenon spread to other countries.[15]

It is far too early to assess the full impact of COVID-19 on EU joinery imports this year, but early signs are that the downturn could be at least as great as during the financial crises of 2008-2009. With trade fairs cancelled, showrooms closed, and deliveries of larger items largely curtailed (at the time of writing) due to social distancing, the joinery industry in Europe has been badly hit by current restrictions on trade and construction site operations.

The EU27 (excluding the UK) tropical timber product imports defied expectations of a COVID-19 driven collapse in the four months leading up to April 2020. Despite all the large western European countries implementing COVID-19 lockdown measures, and mounting supply-side problems in tropical countries, total imports of tropical wood and wood furniture products into in the EU27 in April 2020 were little changed compared to March 2020.[16] The lack of evidence so far of a further downturn in direct response to the COVID-19

outbreak is likely just a reflection of the long lead times in the tropical wood supply chain.

Given widespread reports during April 2020 of EU importers struggling to deal with a buildup of stock that could not be shifted as manufacturers, retailers, and construction sites went into lockdown, a more significant decline in imports may be seen in the figures for the second half of 2020.

More positively, it should be noted that the DIY sector in the EU remained quite buoyant in some countries throughout the lockdown months with many people taking the opportunity to carry out home improvement work. In EU countries with less stringent lockdowns (such as the Netherlands and Sweden) commercial construction and some manufacturing activity also continued without interruption, though at a slower pace. In the UK (the hardest hit country in Europe), sales of joinery products are showing some tentative signs of recovery.

EU imports of tropical wood and wood furniture products totaled to US$1.13 billion between January and April 2020, 9% less than in 2019. Even before the effects of COVID-19 are seen in the trade data, there was significant shrinkage in the EU market for most tropical wood products in 2020.[17] The latest market reports indicate that some hardwood markets show signs of recovery.[18]

Wood processing businesses are reported to be facing sharp rises in input prices for wood and other materials as freight costs have increased $500–1,000 per container. Unfortunately, this same situation now prevails in many manufacturing regions. The survival of companies has increasingly become dependent on the extent, efficiency, and effectiveness of government intervention to help them ride out the storm.

Construction sector forecasts such as UK-based CPA (Construction Products Association) main construction scenario indicate a V-shaped (or a tick-shaped) recession and recovery, with overall construction output anticipated to fall by 20% during 2020 before recovery in 2021 during which construction output rises by 18.0% from its low.[19] Not all countries are expected to face quite such dramatic swings — in German cities a combination of factors mean the current cycle of high demand and high prices is likely to be relatively unaffected by the pandemic, driving the construction sector.[20]

The tropical wood industry that eventually emerges from this crisis may be very different from that which entered it. As countries begin to come out of lockdown, manufacturing plants typically reopen, but local lockdowns have the potential to bring production to a halt. Port, customs, and shipping delays continue.[21] It is clear that the whole supply chain from forest to end consumer is interdependent, and where one or more players are restricted in trade, there are vast negative implications both up and down stream. Opinions on the future vary widely, ranging from those hoping for a quick bounce back to those facing a loss of customers or suppliers.

Photo Mark van Benthem, Probos

2 Methodology

The collation of data on the volume or quantity of verified sustainable wood products within the EU has been an ongoing challenge. The underlying difficuty is that neither FSC or PEFC certification schemes currently collect this information at source.[22] This study aims to fill the gap in knowledge, building on previous studies to expand the scope to a selection of secondary tropical wood products.

2.1 Product scope of this study

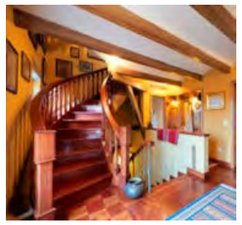
There are over 900 individual Customs Codes (HS codes) that relate to wood products in international trade.[23] As a result, the volume of data relating to international trade in wood products is large and often complex. With 27 EU Member States + the UK and 28 International Tropical Timber Organization (ITTO) producer countries, there are potentially in excess of 700,000 bilateral product flows to monitor. This report thus focuses **on a selection of secondary products** and the associated methodological challenges posed by this novel format of analysis.

The analysis covers **HS code 4418 (doors, window frames, and related joinery products) and HS 4409 (tropical wood mouldings using 2019 trade data** (see Annex 2 for code descriptions). These secondary products primarily consist of wooden doors and mouldings the product groups with the highest import values by the EU27 + UK. These products were selected as they are well defined under the international trade data HS coding and the markets are relatively straightforward to analyze.

Based on volume and value, wood furniture is also an important secondary product to consider in analysis, but the complexity of the product group within the actual market and in international trade statistics and markets lead to its exclusion from this report. There is also some doubt as to the significance of tropical wood included in furniture sold in the EU — it is estimated that only 3.5% of the volume of furniture sold in Europe is from tropical countries, and only a proportion of this might be regarded as 'tropical wood' (from natural forests).[24]

This report quantifies four product groups of secondary tropical wood products:

1. External and internal doors, their frames and thresholds; all made from tropical wood (HS code 44182010)
2. Tropical wood mouldings, such as skirting boards and beading (HS code 44092200)
3. Builders' joinery and carpentry made from tropical wood, such as staircases (selection of HS 44189990)
4. Tropical wood window frames including pairs of doors, external doors, and their frames (HS 4418101)



2.2 "Exposure to certification"

Traditionally, trade flow studies apply a 'source approach,' a time consuming process that determines volumes of verified sustainable wood as they enter the market. Applying a source approach for the seven main tropical timber consuming countries let alone the EU27+UK would require considerable resources. We therefore draw on the concept of "*exposure to certification*" pioneered by the Forest Law Enforcement Governance and Trade (FLEGT) Independent Market Monitor (IMM). This approach measures the 'exposure' or 'access' to certified timber rather than the 'share of timber supply' or 'market share.'

The *exposure to certification* method is based upon a basic analysis of forest and trade data. It considers the share of FSC and PEFC certified forests compared to the total forest area, and projects this share onto the export data of the ITTO producer country (Annex 3) in question. The analysis only includes direct imports and **excludes** indirect imports. Intra-EU trade, transit trade, and re-exports are **not** taken into account.

The research method is in-line with the one used in last year's study for primary wood products, with some alterations to accommodate the poor data availability and complexity of secondary tropical wood products.[25] The basic method to calculate an estimate of exposure to certification was refined by using additional data sources and incorporating the experience of exporters, importers, and organizations across the globe. Further analysis refined the area of productive forest and allowed an assessment of timber quantities actually produced in certified forests.

The net result is a repeatable methodology that allows for the current best estimate of the share of secondary wood products exposed to certification for the EU27 + UK market and individual member states. While interpreting the results of the exposure to certification measure it is important to keep in mind that it is *not the same* as the market share of certified sustainable products that enter the market.

It should also be noted that the primary focus of the analysis is the level of exposure to FSC and PEFC **certification**. Where appropriate some specific analysis of **FLEGT Licensed** materials (from Indonesia) and materials from **verified legality schemes** has been included, though the total estimates of exposure to certification by region or country **exclude** FLEGT Licensing and verified legal schemes.

There are several legality verification schemes that help companies around the world to claim legal compliance for their forest operations. As with certification of SFM, legality verification includes third party field inspections and reviews of documentation and management. Despite the fact that there is no universal agreed definition of legality, the FLEGT VPA, EU Timber Regulation, and public procurement policies (from the UK, Denmark, Belgium, and Netherlands among others) address the same aspects and are broadly consistent. These aspects generally include legal right to harvest, compliance with legislation related to forest management, environment, labour and welfare, health and safety, taxes and royalties, respect for tenure or use-rights to land and resources that may be affected by timber harvest rights, and compliance with requirements for trade and export procedures including CITES.[26]

The following **third party legality verification schemes** have been included in the analysis: Timber Origin and Legality (OLB, Bureau Veritas), Timber Legality Verification (TLV, Control Union Certifications), FSC Controlled Wood (FSC-CW), and LegalSource (NEPCon).[27]

2.3 Description of sources

In order to generate the exposure to certification data for EU27 + UK imports of **secondary tropical wood products**, we combined a variety of input data to form a comprehensive database for the calculations. The list of secondary tropical wood products covered including corresponding HS-codes is presented in Annex 2.

The key data sources for the analysis include:

1. **STIX** data on import of wood products (HS44) by the EU27 + UK.[28]
   a. Secondary tropical wood products (doors, mouldings, and other joinery and windows) were included in the analysis.
   b. Primary tropical timber products such as roundwood, sawnwood, veneer, and plywood were excluded because they were analyzed in last year's study.
2. **Food and Agriculture Organization of the United Nations (FAO)** data on total forest area, production forest area, and multifunctional forest area (Forest Resource Assessment, 2015 & FAO Status of tropical forest management, 2011).
3. **FAO Data on Industrial Forest Concessions** (FAO Forest Concessions – Past Present and Future, 2016).
4. **Data on forest certification** (FSC & PEFC website, facts & figures, and individual audit reports), excluding FSC and PEFC certified plantations.
5. Internal Probos Data on categorization of Tropical / Non-Tropical Countries.
6. Internal Probos Data on tropical Timber Products (listing all relevant HS codes).
7. **International Tropical Timber Organization (ITTO)** export data on tropical wood products (ITTO, 2018).
8. **Data on legal verification schemes** from various scheme owners.

To gain more insight into forest management, tropical timber trade, and certification, several **surveys** were developed:

1. **Focusing on forest management information** with regards to average yield in regular and certified sustainably managed forests, areas set aside, rotation periods, etc. Targeting experts and representatives of the FSC and the PEFC national and regional offices.
2. **Focusing on imports by European traders.**
3. **A combination of 1 and 2,** targeting large certified producers via ATIBT (the International Technical Association for Tropical Timber) and TBI (The Borneo Initiative).
4. A **specific questionnaire** that was developed for the purpose of this study and used at workshops and interviews in France, Italy, Spain, and Germany. This questionnaire focused on verified sustainable tropical timber imports, market developments, and main domestic markets for tropical timber, with special focus on the selected secondary timber products. The main actors such as trade federations, national FSC and PEFC offices, and researchers were contacted by national experts on the topic.
5. **Directed to the main producing countries of the selected secondary tropical wood products** regarding production volumes, certification, and origin of production materials.

Photo Mark van Benthem, Probos

2.4 Steps to calculating exposure to certification

Data collated from the above sources was to calculate quantities exposed to certification. The steps taken during analysis are explained in detail in Annex 1. Figure 1 below provides an overview of the calculations.

The nature of the data available necessitated certain limitations and/or assumptions that are worth noting:

- Combining STIX data and ITTO Data means that EU member state intra-trade data is not analyzed.
- Imports of tropical timber products from non-ITTO countries are not included in this study. Direct imports cover the vast majority of secondary tropical wood products imported by the EU27 + UK, so the consequences of the absence of the indirect trade are considered to be limited (China perhaps is the exception with trade volumes equivalent to 5% of ITTO imports).
- The product group 'other joinery' (HS 44189990) contains both tropical and non-tropical timber products. In order to correct for this we generated a ratio based on export quantities of tropical/non-tropical doors, mouldings, and windows to the EU27 + UK for each ITTO producer country, and multiplied this ratio by the total export of 'other joinery' to the EU27 + UK to estimate other joinery from tropical timber.
- The focus of the study is solely on natural and semi-natural tropical forests (we have actively sought to exclude material from plantations).
- We assume that 50%–80% of all certified tropical timber travels to Europe along existing trade flows based on (limited) data from various sources, and GTF and Probos expert knowledge and field experience.
- An assumption regarding the total production of these secondary tropical wood products is made for each ITTO producer country. We calculated a ratio of global export of primary tropical timber products and the export to the EU27 + UK. This ratio was then applied to the export per ITTO country to the EU27 + UK to generate an estimate of the global export of secondary tropical wood products for each producing country.

Figure 1 Overview of the steps involved to produce the exposure to certification data

Steps	Values generated	Data source
Step 1: Calculate EU27 + UK tropical timber product imports	Tonnes of products	STIX and ITTO
Step 2: Determine productive forest area in tropical countries	Productive hectares	FAO
Step 3: Determine certified forest area in tropical countries, VPA status and presence of verified legal systems in tropical countries	Certified hectares	FSC, PEFC, FLEGT IMM & verification schemes
Step 4: Determine the share of forest area certified and legally verified in tropical countries	% share	Combined Steps 2 and 3
Step 5: Calculate the total global export of selected secondary products from each producing country exposed to certification and legal verification	Tonnes of products	STIX, ITTO and Step 4
Step 6: Calculate export to EU27 + UK exposed to certification and legal verification	Tonnes of products	Internal assumptions on % certified exported to EU27 + UK
Step 7: Validate the outcome for EU27 + UK and 7 main tropical timber importing countries	Perceptions and alternative values	Interviews for market perspective
Step 8: Determine the additional required forest area to be certified to sustain 100% certified EU27 + UK demand of tropical secondary timber products	Certified hectares	STIX, certification audit reports, questionnaires amongst concessionaires, and interviews with regional and national offices of the FSC and the PEFC

Photo Mark van Benthem, Probos

3 European secondary tropical timber products market

3.1 Secondary wood products market in the EU27 + UK

The total 2018 production value of the wood manufacturing sector in the EU27 + UK was €134.8 billion.[29] The wood and wood products manufacturing sector includes the initial processing stages (sawmilling and planing) and the downstream creation of products. Over 75% of the value added in the sector comes from wood product manufacturing.[30]

To put matters into perspective, the total production value of wooden doors and windows in the EU27 + UK was €5.9 billion and €7.1 billion respectively. In 2018 over 95% of the wooden doors and 99% of wooden windows bought on the European market were domestically produced, though these products were not solely manufactured with European timber or semi-finished timber products.[31]

Figure 2 shows the long-term trends in EU27 + UK imports of primary tropical timber products, the selected secondary tropical wood products, and furniture from VPA partner countries.[32] All three groups of products show a declining trend after the economic crisis in 2008, which continued for several years until at least 2013. Imports of tropical sawnwood and logs decreased particularly dramatically. In the following years the market for tropical timber seemed to stabilize and in some cases slowly recover. Imports of secondary tropical wood products seemed to recover rather fast after 2013, though due to a change in product codes for moulding in the Harmonized System of international trade between 2016 and 2017, it is difficult to make comparisons to recent years. When only doors, windows, and other joinery is considered, a definite increase in imports is observable — 2019 imports to the EU27 + UK are nearly double 2014 values. The import of wood furniture from VPA partner countries also shows signs of recovery from its low point in 2013. The increasing trend in import value of secondary tropical wood products and rather static import value of primary timber products suggests that the imports of the EU27 + UK are perhaps gradually shifting towards more processed/value-added products.

Germany is by far the biggest manufacturer of wooden doors, followed by the UK, France, Italy, and Spain. There is significant variation in the performance of the wood door sector in varying EU countries. Production in Germany, Spain, and the Netherlands increased continuously throughout the last few years, whereas the production in other countries was more volatile.

Wood door imports into the EU27 + UK totaled €352 million in 2018, accounting for 4.8% of the total value of wood doors supplied to the EU27 + UK.[33] Approximately half of these imports originated in tropical countries. Indonesia and Malaysia have successfully penetrated the European market for door panels and finished wooden doors. Other tropical countries mainly serve as suppliers of raw wood materials to the European market.

The general wood door industry in the EU27 + UK revolves these days mainly around products that are manufactured using engineered timber to comply with high requirements regarding energy efficiency and create stable products with a long service life. Composite doors combining steel-reinforced PVC outer frames and an inner frame of hardwood and insulation material are a key trend in the European wood door industry. These products make it hard for tropical timber to compete, though tropical hardwood might have a place in the design of these products with manufacturers looking to combine high quality, good environmental credentials, a competitive price, and an aesthetic appeal.

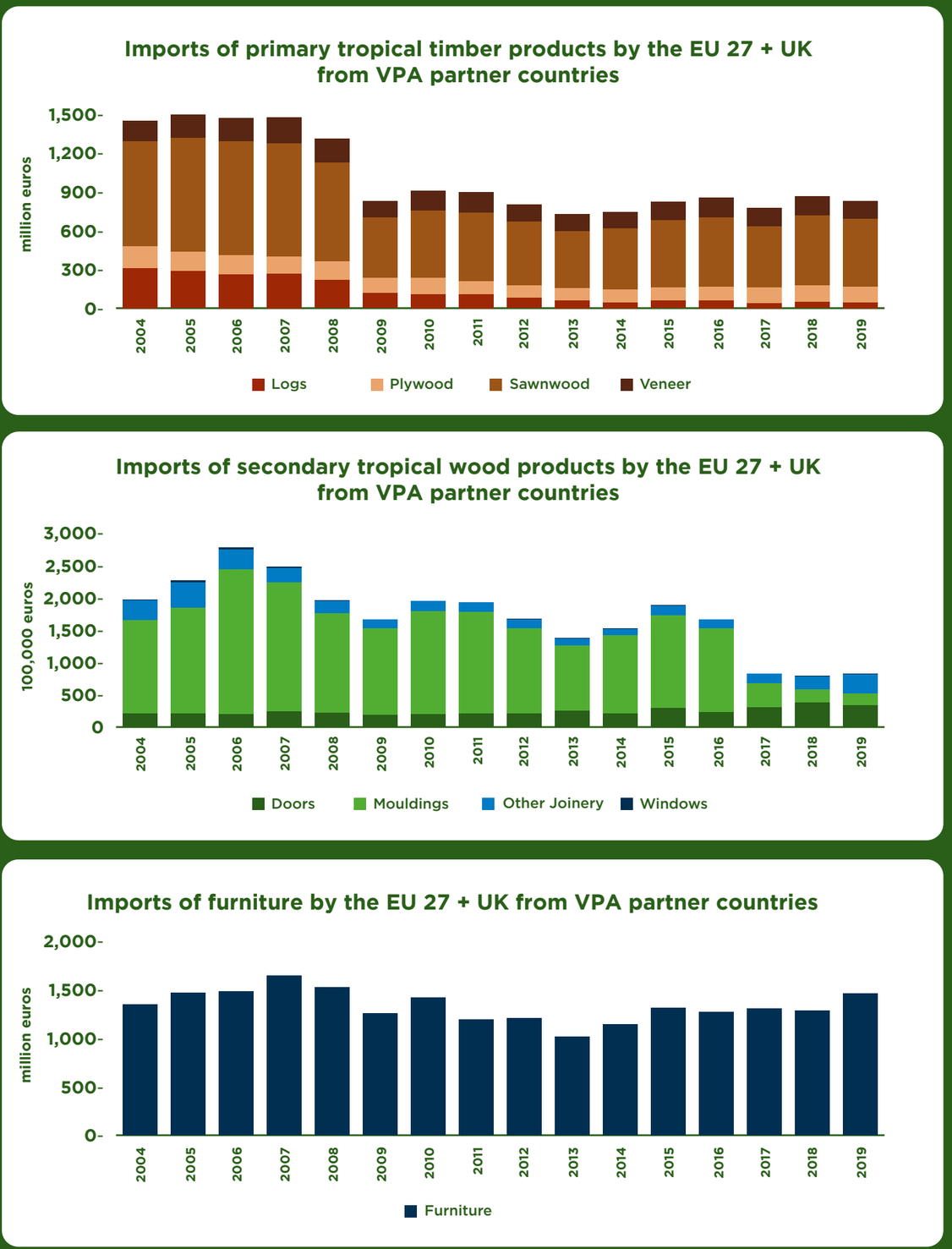


Figure 2 Imports of tropical (1) primary timber products, (2) secondary tropical wood products, and (3) furniture by the EU27 + UK from VPA partner countries. For secondary tropical wood products the graph shows a strong decline in imports of mouldings from 2016 to 2017. This is due to a change in HS-codes rather than a direct decline in imports. Note that the units of primary timber products and furniture (million euros) differ from secondary tropical wood product imports (100,000 euros).

Despite a decrease in production of 13%, Italy was by far the biggest manufacturer of wooden windows, followed by Germany, Poland, and the Netherlands in 2019. Besides Italy, the production also declined in the UK and Poland, whereas the production value in France, the Netherlands, and Germany increased.

Only 0.6% (€37 million) of the wooden window supplied to the European market were imported from outside the EU27 + UK. A declining fraction of this was imported from tropical countries — the Philippines, Indonesia, Gabon, and Malaysia are the main tropical countries that export wooden windows to the European market. Tropical wood is still used in domestic manufacturing of windows.

The European window sector also demonstrates a notable trend towards engineered wood instead of solid timber. However, tropical timber species such as meranti, sapele, and iroko are still considered a high-end niche in this market. Wood (especially tropical wood) experiences serious competition from non-wood materials in the window sector. This is reflected in the relatively stable wood window production numbers amidst a rise in overall construction activity.[34]

The fact that wood experiences competition from other materials is evident in the Eurostat PRODCOM data.[35] In a timeframe of four years (2014–2017), the total EU27 + UK consumption of doors and windows manufactured from aluminum and steel increased by 26% and 28% respectively. During the same period, the consumption value for wooden doors increased only 4%. As a consequence, the share of wood decreased from 30% to 28% of total European window and door consumption.

The European production of "continuously shaped" wood (mouldings) of coniferous and non-coniferous origin (excluding bamboo) were valued at €2.1 billion in 2019.[36] Germany, Austria, Italy, and France are the main producers of these products. The production value of these products is relatively small but the import share — approximately 25% of the continuously shaped wood products brought to the European market are imported from outside the EU27 + UK — is large compared to wooden doors and windows. Of these imports approximately 56% consist of tropical hardwood.[37]

Similarly to wooden doors and windows, continuously shaped wood products (of tropical wood) experience intense competition from substitute materials, mainly wood-plastic composites. The rise of thermally and chemically modified European wood species (both hardwood and softwood) also challenges the market for tropical timber.

3.2 EU27 + UK imports and exports of secondary tropical wood

Import figures

In 2019 the EU27 + UK imported a total of 187,500 tonnes of secondary tropical wood products (those that fall within the scope of this study — see Annex 2) directly from ITTO producer countries.

An overview of the EU27 + UK imports of the selected secondary tropical wood products on an individual country level is presented in Table 2. **France** is the largest importer of secondary tropical wood products, followed by the **Netherlands**, **Germany**, **Belgium**, and the **United Kingdom**. These five countries together account for approximately 90% of the total EU27 + UK secondary tropical wood product imports. Italy and Spain, large importers of primary tropical wood products, import far less secondary tropical wood products.

The remaining 20 EU27 countries import approximately 14,100 tonnes of secondary tropical wood products, 8% of the total EU27 + UK import. Denmark, Portugal, Poland, Sweden, and the Czech Republic account for 77% of the imports by these other EU27 countries.

The 15,900 tonnes of EU27 + UK tropical door imports equals approximately 477,800 individual doors and the 223 tonnes of tropical window imports represent roughly 5,700 pieces. Mouldings and other joinery products have not been converted into number of pieces due to the large variety within these product groups.

Figure 3 shows the percent of EU27 + UK secondary tropical wood product imports by importing country. France accounts for 31% of the total imported volume, while Spain (smallest of the seven main primary tropical wood importers) accounts for just 1% of the total EU27 + UK imports.

Figure 3 Relative share (%) of 2019 EU27 + UK direct imports of selected secondary tropical wood products by country.

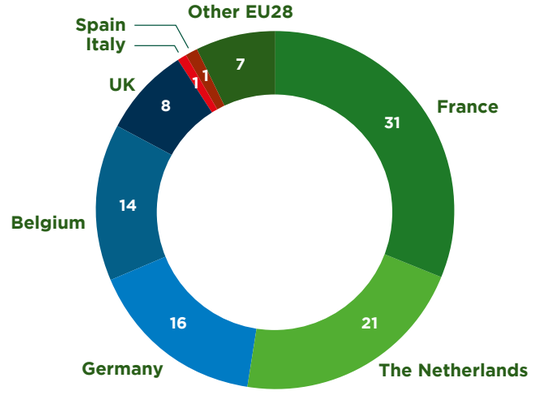


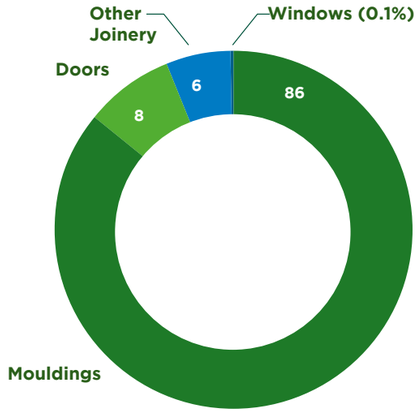
Table 2 Major importers of secondary tropical wood products to the EU27 + UK in 2019 (in tonnes)

Country	Doors	Mouldings	Other Joinery	Windows	Total
France	1,500	55,600	1,700	22	**58,800**
The Netherlands	5,100	31,500	3,000	134	**39,700**
Germany	0	30,100	100	0	**30,200**
Belgium	100	24,300	2,200	0	**26,600**
United Kingdom	8,900	5,100	400	10	**14,400**
Italy	0	1	1,500	45	**2,600**
Spain	0	900	400	1	**1,300**
Other EU27	300	12,400	1,400	11	**14,100**
Total EU27 + UK	**15,900**	**160,800**	**10,700**	**223**	**187,500**

It is important to recognize that the numbers presented in figure 3 reflect imports of secondary tropical wood products at the point where they first enter the EU27 + UK. Countries such as Belgium and the Netherlands serve as entry point for tropical wood products due to their large harbors, and the imported products are distributed over the rest of Europe from these countries. Therefore it is important to realize that the numbers presented above reflect direct import and do not equal consumption within these countries.

The majority of secondary tropical wood product imports are mouldings: 86% of the EU27 + UK total direct imports were mouldings. Tropical doors represent 8% of the EU27 + UK imports of secondary tropical wood products, followed by other joinery (6%). The quantity of tropical windows imported to the EU27 + UK (0.1%) is negligible (Figure 4).

Figure 4 Share (%) of the EU27 + UK imports of selected secondary tropical wood products by product group in 2019



Countries of origin

Analysis of the origin of the EU27 + UK's selected secondary tropical wood product imports for 2019 shows that **Indonesia** (79,400 tonnes) is the largest supplier of secondary tropical wood products to the EU27 + UK. Indonesia's leading role as a supplier of this commodity group to the EU is due both to the popularity of bangkirai (*Shorea laevis*) for decking applications in Europe and to Indonesia's ban on rough sawn exports, encouraging greater focus on value-added products.[38] **Brazil** also exports significant quantities of secondary tropical wood products (65,300 tonnes). Brazilian timber species such as ipe (*Handroanthus spp.*), garapa (*Apuleia leiocarpa*), and massaranduba (*Manilkara bidentata*) are widely used for decking. Together these two countries are responsible for over three-quarters (77%) of the total EU27 + UK imports of the selected secondary tropical wood products. Besides these two countries, 19% of the secondary tropical wood products imported by the EU27 + UK come from **Malaysia, Peru, Gabon, Bolivia** and **Vietnam**. The remaining 23 ITTO producer countries are responsible for the outstanding 7,100 tonnes (4%) imported to the EU27 + UK (Table 3). Cameroon, Republic of Congo, Suriname, and Côte d'Ivoire together are responsible for 77% of the total quantity from this last group.

While interpreting these data it's important to note that countries with large harbors like Gabon may export timber from other countries, leading to an overestimation of the actual timber volume produced in that country and exported to the EU27 + UK. Results from the surveys conducted as a part of this study suggest that Indonesia and Brazil do not export large volumes of wood from other countries.

Table 3 EU27 + UK direct imports of the selected secondary tropical wood products by country of origin in 2019 (tonnes)

Country	Doors	Mouldings	Other Joinery	Windows	Total
Indonesia	13,800	59,500	6,000	147	79,400
Brazil	0	62,600	2,700	20	65,300
Malaysia	1,900	8,300	300	10	10,500
Peru	0	9,600	0	0	9,600
Gabon	0	7,600	0	45	7,600
Bolivia	0	5,600	0	0	5,700
Vietnam	100	900	1,200	0	2,200
Other ITTO prod.	0	6,700	400	1	7,100
Total	**15,900**	**160,800**	**10,700**	**223**	**187,500**

Note: Totals may not add up due to rounding of individual countries.

Table 3 presents the seven main ITTO producer countries that export secondary tropical wood products to the EU27 + UK. It is worth mentioning that approximately 10% of the **mouldings** imported by the EU27 + UK come from 'other' ITTO producer countries, and 70% of this quantity comes from four African countries: Cameroon (1,900 tonnes), Republic of Congo (1,200 tonnes), Côte d'Ivoire (900 tonnes), and Ghana (600 tonnes). Suriname represents (1,100 tonnes) a significant volume on behalf of Latin America.

Figure 5 shows the relative share of the EU27 + UK selected secondary tropical wood product imports by ITTO producer countries. Indonesia accounts for 43% of the total imports by the EU27 + UK, while on the other end of the spectrum Vietnam represents just 2% of imports.

Figure 5 Relative share (%) of the EU27 + UK selected secondary tropical wood product imports by ITTO producer countries.

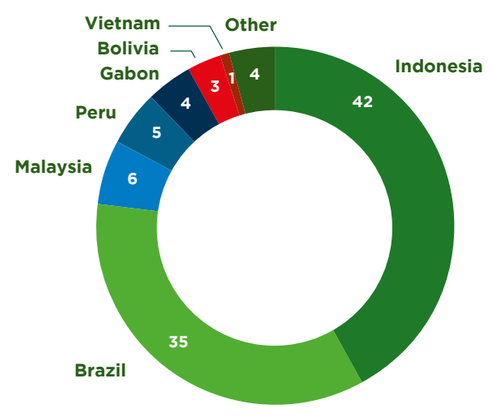


Table 4 Origin of EU27+UK secondary tropical wood product imports by region in 2019 (tonnes)

Region	Doors	Mouldings	Other Joinery	Windows	Total
Africa	0	12,500	300	45	**12,900**
Asia	15,800	69,100	7,600	157	**92,700**
Latin America	100	79,200	2,700	20	**82,000**
Total	**15,900**	**160,800**	**10,700**	**223**	**187,500**

Note: Totals may not add up due to rounding of individual regions.

The countries of origin have been grouped in order to show which regions of the world are most important for the supply of the selected secondary tropical wood products for the EU27 + UK (Table 4). **Asia** (92,700 tonnes) is the largest supplying region, followed by **Latin America** (82,000 tonnes), and **Africa** (12,900). Asia supplies over 99% of EU27 + UK imported tropical doors, and is the largest supplier region of `Other Joinery' (72%) and windows (71%). Latin America is the biggest region of origin for EU27 + UK tropical wood mouldings (49% of total imports). The secondary tropical wood products originating in Africa mainly consist of mouldings (97%).

Figure 6 shows the relative share of EU 27 + UK secondary tropical wood product imports by geographic region of origin. **Asia** (49%) represents almost half of the selected secondary tropical wood product imports of the EU27 + UK. **Latin America** (44%) follows closely, and **Africa** (7%) covers the remainder of EU27 + UK imports.

Figure 6 Relative share (%) of EU27 + UK total selected secondary tropical wood product imports by region of origin in 2019

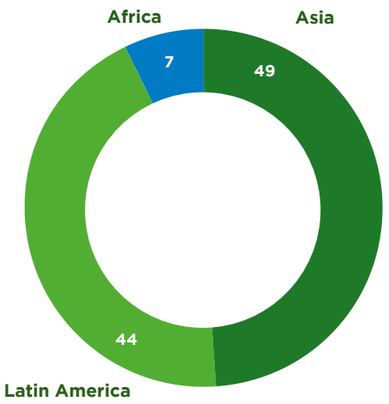


Photo Weekamp Deuren

3.3 Certification and verification exposure of the EU27 + UK

The crux of this report drives at understanding certification exposure and associated environmental, sociological, and ecological impacts. We know that certification drives forest conservation, and understanding the scope of the EU market for certified timber translates directly to impact on the ground and in forests throughout the tropics.

Based purely on the exposure method an estimated quantity of 74,100–97,000 tonnes (39.5%–51.7%) of the selected secondary tropical wood products directly imported into the EU27 + UK are exposed to certification.

However, after a comparison with estimates by national experts within the seven biggest EU27 + UK tropical timber consuming countries, this initial estimation seems rather high. The most likely reason why the initial estimate of the certification exposure is so high is that the majority of the EU27 + UK selected secondary tropical wood imports come from Indonesia, where all exports are verified by a FLEGT License.

The comparison with the estimates of the certified market shares for the seven importing countries gave rise to adjustment of the quantity of EU27 + UK secondary tropical wood product imports exposed to certification. The adjustment results in a range between 54,700–69,400 certified tonnes in 2019.

This means that approximately 29% to 37% of the EU27 + UK total direct imports of the selected secondary tropical wood products are estimated to be exposed to certification.

Table 5 Total direct imports and estimated market share of selected secondary tropical wood products exposed to certification for the seven main tropical timber importing countries of the EU27 + UK in 2019

Country	Import (metric Tonnes)	Market share exposed to certification (adjusted)	Assumed certified import (metric Tonnes)	Relative share within the total import exposed to certification by the 7 main EU27 + UK tropical timber importing countries
France	58,800	20% - 30%	11,700 – 17,600	23.7%
The Netherlands	39,700	65% -70%	25,800 – 27,800	43.1%
Germany	30,200	15% - 30%	4,500 – 9,000	10.9%
Belgium	26,600	25% - 30%	6,700 – 8,000	11.8%
United Kingdom	14,400	40% - 45%	5,800 – 6,500	9.9%
Italy	2,600	5% - 12,5%	100 – 300	0.4%
Spain	1,300	10% - 15%	100 - 200	0.3%
Total	**173,500**	**29% - 37%**	**54,700 – 69,400**	**100%**

The 2019 report estimated that the top seven importing countries' exposure to certification for primary wood products in 2018 was between 243,000 and 403,000 tonnes (25%–32%).

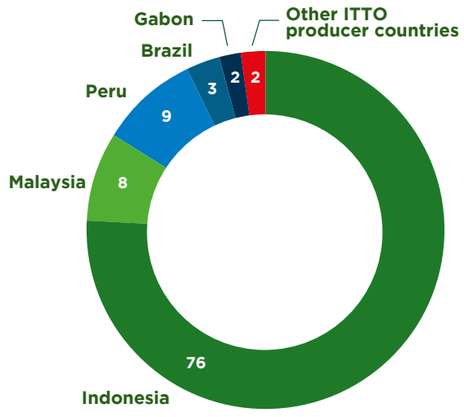
Table 5 shows the estimated percent of secondary tropical wood product imports exposed to certification for each of the seven main EU27 + UK tropical timber importing countries.

With approximately 25,800–27,800 tonnes, the **Netherlands** is the largest importer of secondary tropical wood products exposed to certification in the EU27 + UK. **France, Belgium, Germany,** the **United Kingdom, Italy,** and **Spain** follow.

Figure 7 shows the relative share of EU27 + UK selected secondary tropical wood product imports exposed to certification by country of origin. **Indonesia** (76%) is by far the largest supplier, followed by **Malaysia** (27%) and **Peru** (15%). Brazil only covers 3% of the total export exposed to certification of secondary tropical wood products despite being a major exporter. This is directly related to the relatively small certified area of semi-natural forests in Brazil. Gabon is the largest African supplier of secondary tropical wood products exposed to certification with approximately 2%.

Approximately 92% of the imported selected secondary tropical wood products exposed to certification by the EU27 + UK are exposed to FSC certification. The remaining 8% is exposed to PEFC certification, all of which comes from Malaysia and Brazil.[39]

Figure 7 Relative share (%) of EU27 + UK direct secondary tropical wood product imports exposed to certification by ITTO producer countries in 2019



FLEGT Licensing and verified legal

In total the EU27 + UK directly imports approximately 79,400 tonnes of secondary tropical wood products with a **FLEGT-license** from **Indonesia** (currently the only FLEGT-licensed country). This represents roughly 42% of all selected secondary tropical wood products imported to the EU27 + UK.

Another 6,700 tonnes (4%) comes from countries implementing VPA. 18,500 tonnes (9%) is estimated to come from VPA negotiating countries.

Approximately 3,400 tonnes (2%) of the total EU27 + UK import of selected secondary tropical wood products is exposed to a verified legal scheme included in the scope of this study.

Results of ATIBT enquiry

The 'ATIBT enquiry' is a collaboration between ATIBT, the International Tropical Timber Technical Association, and Probos focusing on trade data, yield per ha, area set-aside, and other nuances of timber operations. The ATIBT enquiry serves as a model for how detailed company data can serve a crucial role in refining high-level data gleaned from customs data sets. Timber producing companies are in the best position to share clear data on yields, certification, impacts, and trade-flows. As awareness of certification grows, and future iterations of this report are released, increasing industry buy-in in sharing market data will be crucial to understanding the market in order to best leverage evidence of impacts.

The enquiry was disseminated among ATIBT's members that manage forests in the Congo Basin. It is important to recognize that the enquiry focused on primary timber products. Five companies replied to the enquiry and these five companies represent a certified sustainable and legally verified forest area of approximately 3.66 million hectares in Congo Republic, Gabon, Cameroon, and Ivory Coast. One of the companies is OLB (Origine et Légalité des Bois) certified. The data concerning average yield in certified sustainably managed forests was used to help calculate the (potential) impact of EU27+UK demand on SFM area (paragraph 3.4).

In 2019 the five companies harvested approximately 890,000 m^3 Round Wood Equivalent (RWE). 485,000 m^3 RWE (55%) was exported to the European market. The five companies indicated that 83% of the exported volume to Europe was actually sold with a FSC or PEFC certificate and an additional 14% was sold as legal verified (OLB, TLV, or LegalSource). This is not completely demand driven, but partly due to company policy prescribing certified material always be sold as such. The results do not present the volume sold as legal verified.

The companies provided more details concerning European exports and indicated the share certified within the export flow to a specific country in 2019. France, Italy, Belgium, the Netherlands, the United Kingdom, Germany, and Spain represent 92% of the total export to Europe by these companies. Figure 8 shows the results per country in absolute volumes for both 2018 and 2019. The share certified in 2019 is highest for **the Netherlands** (86%), followed by **Belgium** (81%), **Italy** (75%), the **United Kingdom** (73%), **France** (64%) and **Spain** (39%). Other European countries show a certified share of 79%.

Except for Italy and the countries in the 'other' group, total export volumes increased between 2018 and 2019. In most cases the exported volume with a FSC or PEFC certificate also grew, though at a slower pace, resulting in lower shares of certified material within the export flow to most countries. The United Kingdom and Belgium are an exception as the share certified increased for both these countries.

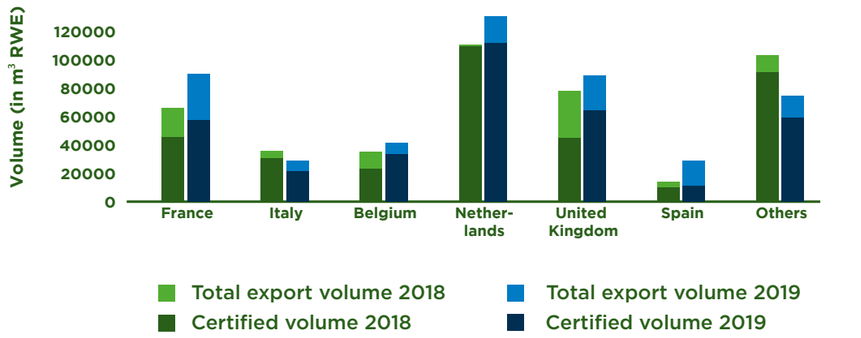
While interpreting these results it is important to keep in mind that they are based on the exports of just five companies in the Congo Basin. For that reason, it is not possible to link these results to the overall market situation in the respective European countries. For instance, the high share of certified exports to Germany is mainly the result of the exports from one company, while two other companies report a much lower share certified exported to Germany. A similar conclusion can be drawn for other countries such as Italy and France. This underlines the importance of increasing the number of responses and the ability to monitor the results long-term. The Netherlands however, shows relatively high shares of certified timber imports across all five companies. For most of the other countries this is not the case.

Results TBI survey

A similar survey to the ATIBT enquiry was disseminated among partners of The Borneo Initiative (TBI). TBI is an international initiative for the promotion of SFM among forest concessions in Indonesia. In total 11 TBI partners responded to the survey; two from manufacturers and nine from forest management units. Although the responses did not reveal significant results concerning certified timber flows to the EU27 + UK, they did provide valuable information on average yield numbers. This information was used to verify the (potential) impact on forests.

The outcome of the ATIBT and TBI survey delivers very valuable information to improve data availability and clarify the practicalities behind the economics of managing certified concessions. We thank ATIBT, TBI, and the members who participated in the survey for their contribution and encourage other (primary) timber producers and relevant organizations in other regions to follow their example and collect this kind of information.

Figure 8 Total exports to European countries and the volume sold with a FSC- or PEFC certificate for four ATIBT members in 2018 and 2019



3.4 Impact on sustainably managed forests

Direct imports of the selected secondary tropical wood products to the EU27 + UK from ITTO producer countries total to 187,500 tonnes. This roughly translates into 574,300 m^3 RWE. Using the trade flows quantified in this study, we distributed imports over the three geographic regions: Africa, Latin America, and Asia (Table 6). We calculated the average harvest per hectare in certified sustainably managed semi-natural and natural forests for each region (excluding plantations), taking into account area set aside where no harvest takes place. For Africa this resulted in a harvest level of 0.26 m^3 RWE per hectare, while for Latin America (0.48 m^3 RWE per hectare) and Asia (0.59 m^3 RWE per hectare) this number was substantially higher. Based on expert consultation we estimate that approximately 55% of the average harvest is in theory suitable for export to Europe (meets secondary tropical wood product requirements). This results in average harvest levels of 0.14, 0.26 and 0.32 m^3 RWE per hectare for Africa, Latin America, and Asia respectively.

Using these average harvest levels and projecting these to the current timber flows, we can estimate that 763,000–925,000 hectares of natural and semi-natural forest are maintained with SFM practices under the current levels of EU27 + UK certified secondary tropical wood product demand. For comparison, a total of 16.3 million hectares (excluding plantations) is currently certified in the tropical regions, representing 6.7% of production forest in the tropics.[40] Therefore, it is estimated that the EU27 + UK currently impacts 4.7%–5.7% of all certified semi-natural and natural tropical forests with its current demand for the selected certified secondary tropical wood products.

If the EU27 + UK sourced 100% certified sustainable selected secondary tropical wood products, approximately 2.1 million hectares of natural or semi-natural tropical forest could be positively impacted by the current demand of the EU27 + UK (shifts in sourcing would affect average yield and subsequently the forest area needed).

In reality this shift in sourcing would further grow the total land dedicated to certified sustainably managed semi-natural and natural forest as there are also other markets demanding these products and individual production forests produce a wide range of species and qualities of material. Producers respond to demand and if Europe demands and prefers verified sustainable material it sends a powerful message that in turn drives improvements in forest management practices that go further than direct supply chains. For example, demand for verified sustainable joinery-quality timber will likely require timber to be sourced from a variety of forest management units and the impact goes beyond the direct links. In turn this impact can improve standards across forest areas not directly or mainly supplying Europe.

A similar analysis was performed for the seven main tropical timber-importing countries of the EU27 + UK. With their current demand of certified secondary tropical wood products, these countries impact approximately 706,000–856,000 hectares of tropical forest. This is roughly 4.3%–5.3% of the total certified productive semi-natural and natural forest area in tropical regions. If these seven countries sourced 100% verified sustainable for their current demand, they could impact a total of 1.9 million hectares of tropical forest.

Table 7 shows the overview of the current and potential area of tropical forests impacted by the import of both primary (data from 2018) and secondary (data from 2019) tropical wood

Table 6: Overview of exports to EU27 + UK, productive forest area, certified forest area, and forest area currently and potentially impacted by EU27 + UK certified import of selected secondary timber products by geographic region

	Africa	Latin America	Asia	Total
Total Export to EU27 + UK (1000 m^3 RWE)	37,5	239,1	297,6	**574,3**
Productive forest area (1,000 ha)	69,339	91,623	82,264	**243.226**
Certified forest area (1,000 ha)	4,540	4,140	7,587	**16.267**
Currently impacted by EU27 + UK (1,000 ha)	43 – 69	92 - 135	627 - 721	**763 – 925**
Potentially impacted by EU27 + UK, with 100% sustainable sourcing (1,000 ha)	262	906	917	**2,085**

Table 7: Overview of current and potential area of impacted tropical forests due to the import of both primary (2018) and secondary (2019) tropical wood products of the EU27 + UK by geographic region impacted

		Africa	Latin America	Asia	Total
Total Export to EU27 + UK (1000 m^3 RWE)	Primary (2018)	2,199	764	1,141	**4,104**
	Secondary (2019)	37	239	298	**574**
	Total	2,236	1,003	1,439	**4.678**
Currently impacted by EU27 + UK (1,000 ha)	Primary (2018)	1,197 – 1,914	165 - 268	1,328– 2,224	**2,689– 4,406**
	Secondary (2019)	43 – 69	92 - 135	627 - 721	**763 – 925**
	Total	1,240 – 1,985	257 - 403	1,955–2,945	**3,452 – 5,331**
Potentially impacted by EU27 + UK, with 100% sustainable sourcing (1,000 ha)	Primary (2018)	10,859	2,546	2.718	**16,122**
	Secondary (2019)	262	906	917	**2,085**
	Total	11,121	3,452	3,635	**18,207**

products of the EU27 + UK. In total, the EU27 + UK impact approximately 3.5–5.3 million hectares of semi-natural and natural tropical forests with current demand for primary (2018) and secondary (2019) tropical wood products. However, sourcing 100% sustainable would potentially impact 18.2 million hectares of semi-natural and natural forest, an additional 12.9–14.8 million hectares.

3.5 Individual country results

In the sections below, each of the seven main tropical wood importing EU27 + UK countries is assessed across tropical timber markets, the selected secondary tropical wood product imports (in the scope of this study), market share exposed to certification, import from FLEGT and other VPA countries, and share exposed to a verified legal system. It is important to realize that there can be significant overlap between exposure to certification, import from FLEGT/VPA countries, and exposure to verified legal schemes.

Table 8: Overview of the certification, FLEGT-Licensing, VPA-status and exposure to verified legal systems of the import of the 7 main tropical timber importing countries of the EU27+UK of secondary tropical wood products in 2019. All figures in Tonnes.

	Total Import	Exposed to certification % (adjusted)	Exposed to certification products	FLEGT Licensed	From VPA implementing country	From VPA negotiating country	Exposed to third party legality verification
Belgium	23,600	25% - 30%	6,700 – 8,000	6,900	2,000	7,100	1,400
France	58,800	20% – 30%	11,800 – 17,600	2,500	2,500	4,000	1,000
Germany	30,200	15% - 30%	4,500 – 9,100	22,000	200	1.500	100
Italy	2,600	5% - 12.5%	100 - 300	600	100	100	100
Nether-lands	39,700	65% - 70%	28,800 – 27,800	29,500	1300	4.100	600
Spain	1,300	10% - 15%	100 - 200	100	0	0	0
United Kingdom	14,400	40% - 45%	5,800 - 6,500	12,500	200	1,300	0
Total	**173,500**	**29% - 37%**	**54,700 – 69,000**	**79,400**	**7,400**	**18,500**	**3,400**

Estimated carbon footprint for the EU27+UK

In the 2018 report concerning Europe's import of primary tropical timber products a total estimated CO_2 reduction of 55-88 million metric tons was reported based on the assumption that forest certification prevents premature re-entry logging, leading to repeated loss of carbon stocks in the affected forests. The estimated amount was attributed to the current EU27+UK demand of certified (primary) tropical timber products.

Improved insights of carbon storage and emissions in tropical forest and its management, combined with improved calculation methods, led to an updated estimation for the carbon impact of EU27+UK demand. This figure was constructed by calculating a CO_2 emission reduction factor per hectare per year in tropical forests, based on Sasaki et al.[45] This factor was subsequently multiplied by the total tropical forest area impacted by the current or potential demand of verified sustainable tropical timber products of the EU27+UK. See below table on estimated CO_2 impacts of preventing premature re-entry logging, linked to current and potential EU27+UK demand for certified tropical timber products.

The new data show that the current demand of the EU27+UK for certified tropical timber secondary products reduces CO_2 emissions per year by between 18.9 and 29.2 T million metric tons. In the case where the EU27+UK would source 100% verified sustainable tropical timber products, they would positively impact an area of over 18 million hectares of tropical forests. This is congruent with a potential reduction of 99.6 million metric tons CO_2 emission per year. Besides premature re-entry logging, there are more carbon benefits to verified SFM increasing the carbon reduction potential.

Table 9 Potential reductions in CO_2 emissions by avoiding premature re-entry logging associated with sustainable primary and the selected secondary tropical wood product imports by the EU27+UK

	Primary products	Secondary products	Total
Currently impacted (x1000 ha)	2,689 – 4,406	763 - 925	**3,452 – 5,331**
Potentially impacted (100% sustainable) (x1000 ha)	16,122	2,085	**18,207**
Current reduced CO_2 emissions (Tg – million metric tons)	14.7 – 24.1	4.2 – 5.1	**18.9 – 29.2**
Potential reduced CO_2 emissions (100% sustainable) (Tg)	88.2	11.4	**99.6**

Belgium

Secondary tropical wood products import
With a total of 26,600 tonnes, Belgium is the fourth largest direct importer of secondary tropical wood products within the EU27 + UK in 2019. However, it is important to keep in mind that the numbers presented represent imports where they first enter the EU27 + UK. Antwerp's harbor serves as a major transport hub so significant volumes are likely distributed to other European countries and thus not be consumed in Belgium. This analysis does not consider EU intra-trade due to the complexity and inaccuracy of such analysis.

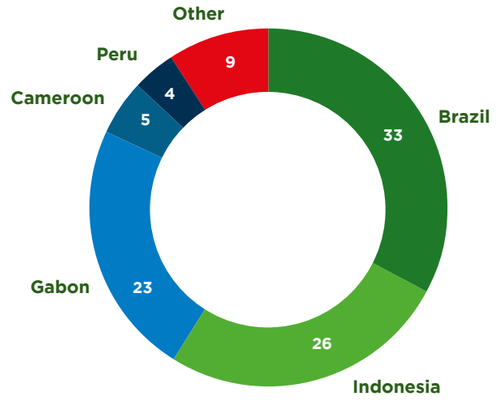
Belgium's imports consist mainly of mouldings. Belgium tropical moulding imports (24,300 tonnes) are 15.1% of the total EU27 + UK tropical moulding imports, making it the fourth biggest importer following France, the Netherlands, and Germany. Besides mouldings, Belgium also imports a relatively large quantity of other tropical joinery (2,200 tonnes), 20% of the total EU27 + UK other tropical joinery imports and second only to the Netherlands. Belgium does not import significant quantities of tropical doors and windows.

Figure 9 shows that Belgium imports one third (33%) of its selected secondary tropical wood products from Brazil. Indonesia (26%) and Gabon (23%) also make up a substantial amount of Belgium's imports.

Table 10 Belgium's direct import of selected secondary tropical wood products in 2019

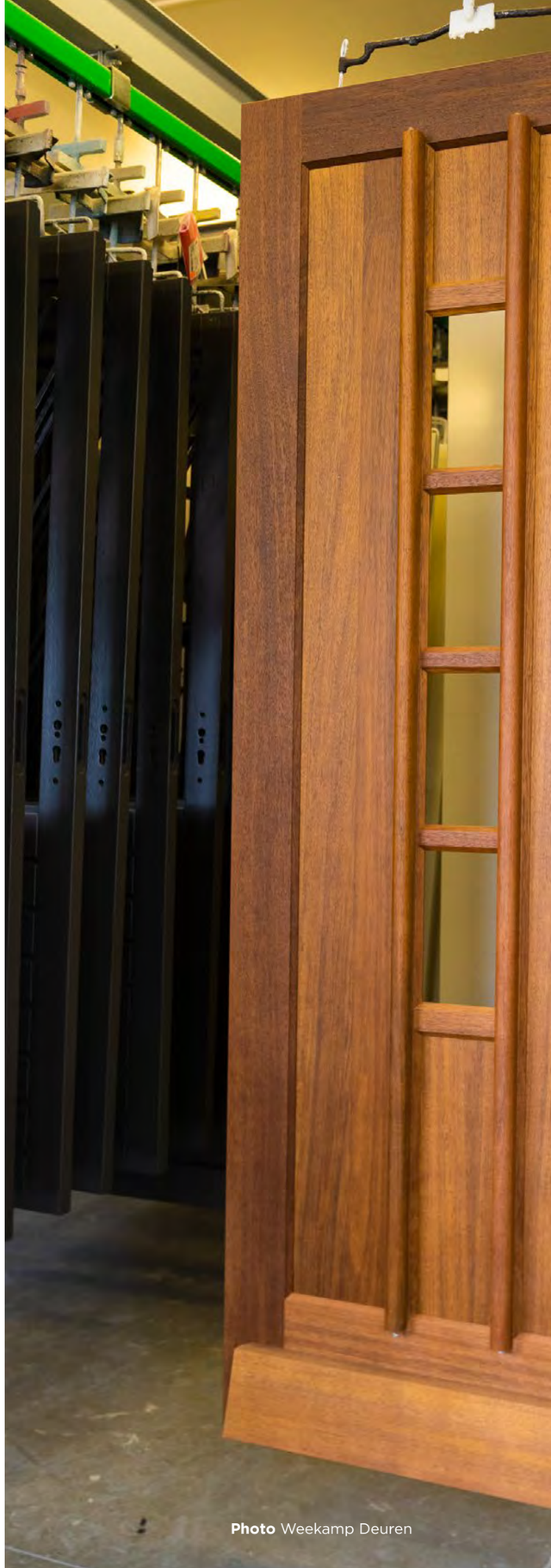
Product group	**Secondary tropical wood product import** (in Metric Tonnes)	**Percentage of total EU27 + UK import**
Doors	100	0.6%
Mouldings	24,300	15.1%
Other joinery	2,200	20.9%
Windows	0	0.1%
Total	**26,600**	**14.2%**

Figure 9 Share (%) of Belgium's direct imports of selected secondary tropical wood products by country of origin in 2019



Exposure to certification
Belgium, along with the Netherlands, is one of the few countries where the overall market share of verified sustainable timber products has been periodically monitored. A 2018 exploratory study examining 2016 data included certification levels of several secondary timber products including doors and windows.[41] While certification of these products was in general rather low, bigger companies regularly showed very high certification rates (70%–100%). However, the study did not differentiate between tropical and temperate hardwood products, limiting the relevance to understanding certified secondary tropical timber products specifically.

It is estimated that 25%–30% of Belgium's primary tropical timber market is exposed to certification. Since over 90% of Belgium's imports of secondary tropical wood products consist of mouldings, it is assumed that secondary tropical wood products experience the same level of exposure to certification as primary tropical timber products.



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France

Tropical wood product imports

With imports of 58,800 tonnes, France was the largest importer of the selected secondary tropical wood products in 2019. This quantity represents almost one third (31.3%) of total EU27 + UK imports. As in most of the seven main European importing countries, mouldings (55,600 tonnes) is France's largest import category, and France leads the EU27 + UK in moulding imports. Mouldings make up approximately 95% of France's total import of the selected secondary tropical wood products. France is also the third largest importer of the other three product groups.

70% of France's direct imports of secondary tropical wood products come from Brazil. Peru exports mouldings solely to France (11% of France's secondary tropical timber imports), the majority likely Ipé for decking. Malaysia, Indonesia, and Bolivia also export secondary tropical wood products to France (Figure 10).

Exposure to certification

It is estimated that 20%–30% (11,800–17,600 tonnes) of the secondary tropical wood products on the French market are exposed to certification, leaving France responsible for approximately 23.7% of the total EU27 + UK import of the selected secondary tropical wood products exposed to certification.

Figure 10 Share (%) of France's direct imports of selected secondary tropical wood products by country of origin in 2019

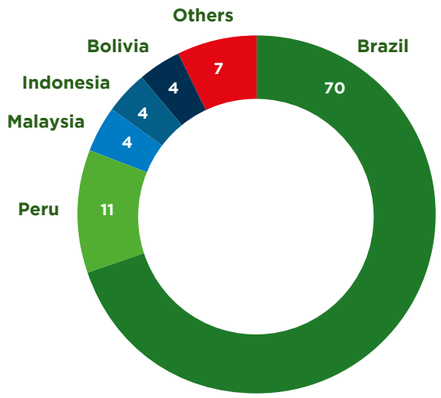


Table 11 France's direct import of selected secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	1,500	9.2%
Mouldings	55,600	34.6%
Other joinery	1,700	16.1%
Windows	<50	9.8%
Total	**58,800**	**31.3%**

The Netherlands

Tropical wood product imports

In 2019 the Netherlands imported a total of 39,700 tonnes of the selected secondary tropical wood products, of which 79% were mouldings (31,500 tonnes). The Netherlands was the second largest importer of tropical mouldings in 2019 with 19.6% of total EU27 + UK moulding imports. The Dutch are also the second largest importer of tropical doors (5,100 tonnes) in the EU27 + UK, approximately one third (32.2%) of total EU27 + UK imports. Netherlands is by far the largest importer of tropical windows (134 tonnes) in the EU27 + UK with 60% of total EU27 + UK imports. With 3,000 tonnes the Netherlands is also the largest importer of other tropical joinery covering 27.8% of EU27 + UK imports.

The Netherlands, like Belgium, serves as an entry point for tropical timber due to its large harbor and traditionally large relative tropical timber consumption. A share of Dutch imports is likely re-exported without further processing via intra-European trade, so consumption of tropical timber products is likely lower than the presented import quantities.

Figure 11 shows that almost three-quarters (74%) of the import of secondary tropical wood imports come from Indonesia. Malaysia (10% of Dutch imports) and Brazil (9%) are also major exporters of secondary tropical wood products to the Netherlands.

Figure 11 Share (%) of the Netherlands' direct imports of selected secondary tropical wood products by country of origin in 2019

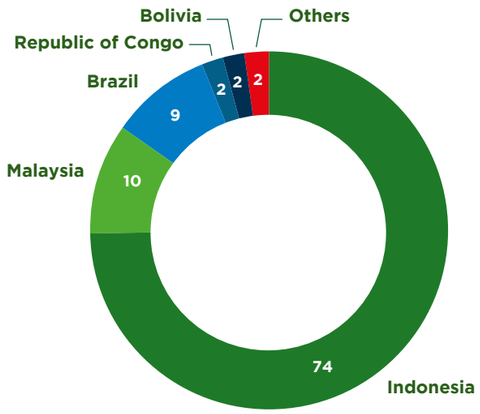


Table 12 The Netherlands' direct import of selected secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	5,100	32.2%
Mouldings	31,500	19.6%
Other joinery	3,000	27.8%
Windows	134	60.0%
Total	**37,700**	**21.1%**

Exposure to certification

The Netherlands, along with Belgium, is one of the few countries where the overall market share of verified sustainable timber products is monitored. The sixth and most recent study on the 2017 market calculated 67% certification for primary tropical timber products. Therefore the exposure to certification of the Netherlands for primary tropical timber products is confidently set at 65%–70%. Given that the profile for sourcing of both primary and secondary products is very similar, we can assume a similar figure for secondary products with a high level of confidence. This assumption results in 25,800–27,800 tonnes secondary tropical wood products exposed to certification (43.1% of the total EU27 + UK exposed imports), making the Netherlands by far the largest importer in the EU27 + UK.

Italy

Tropical wood product imports

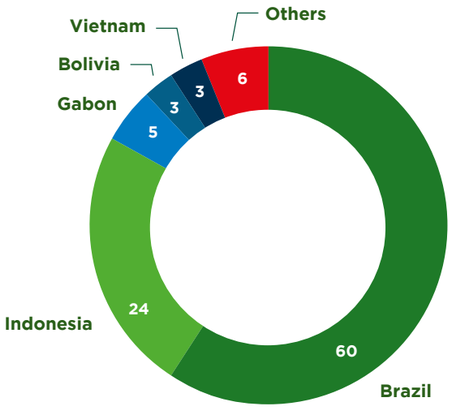
With a total direct import of only 2,600 tonnes of secondary tropical wood products, Italy accounts for approximately 1% of total EU27 + UK direct imports. Countries that traditionally import less tropical timber, such as Denmark and Portugal, imported more secondary timber products than Italy in 2019. Unlike most other importing countries, joinery (1,500 tonnes) is the largest product group imported by Italy, making up 58% of Italy's total import of secondary tropical wood products. This is approximately 14% of the total EU27 + UK imports of other joinery. In absolute numbers, Italy is the second largest importer of tropical windows (45 tonnes) in the EU27 + UK, 20% of the total imports of tropical windows. The volume of mouldings (1,000 tonnes) imported by Italy is substantially less significant on an EU27 + UK scale, representing less than 1% of the total EU27 + UK imports. Remarkably, Italy did not import any tropical doors directly from ITTO producer countries in 2019.

Table 13 Italy's direct import of secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	0	0.0%
Mouldings	1,000	0.6%
Other joinery	1,500	13.9%
Windows	45	20.3%
Total	**2,600**	**1.4%**

Italy traditionally imports its primary tropical timber products mainly from African countries, but approximately 60% of secondary tropical wood products were imported from Brazil. Indonesia also accounts for a significant percentage of Italy's imports. Gabon is the largest African country covering 5%, and is also the sole exporter of tropical windows to Italy.

Figure 12 Share (%) of the Italy's direct imports of selected secondary tropical wood products by country of origin in 2019



Exposure to certification

Low demand for certified tropical timber in Italy and a limited role for public procurement result in a low market share for Italy's primary tropical timber products exposed to certification (5%–12.5%). Imports of secondary tropical wood products exposed to certification are also low, ranging from 100–300 tonnes. This quantity is nearly negligible on a EU27 + UK scale, just below 0.5% of all EU + UK exposed imports. Timber related sustainability discussions in Italy are mostly focused on European Union Timber Regulation.

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United Kingdom

Tropical wood product imports

More than 60% of the United Kingdom's total imports of the selected secondary tropical wood products consist of tropical doors (8,900 tonnes). The United Kingdom imports over half (56%) of all tropical doors coming to the EU27 + UK, by far the biggest importer of tropical doors. Besides doors, the United Kingdom imports mainly mouldings (5,100 tonnes), which account for 35% of the United Kingdom's imports but just 3.2% of the total EU27 + UK direct imports of tropical mouldings. Imports of other joinery and windows are relatively small, just 3.9% (400 tonnes) and 4.5% (10 tonnes) of EU27 + UK total imports respectively. The United Kingdom's imports of secondary tropical wood products total to 14,400 tonnes, roughly 7.7% of the EU27 + UK's total direct imports of the selected secondary tropical wood products.

Indonesia is by far the largest supplier of secondary tropical wood products for the United Kingdom and supplies approximately 86% of all selected secondary tropical wood product imports. With Malaysia covering another 9% of the United Kingdom's imports it is safe to say that southeast Asia is the UK's main supplying region for secondary tropical wood products. Notably, all imports of tropical doors and 95% of tropical moulding imports by the United Kingdom come from Indonesia and Malaysia.

Figure 13 Share (%) of the UK's direct imports of selected secondary tropical wood products by country of origin in 2019

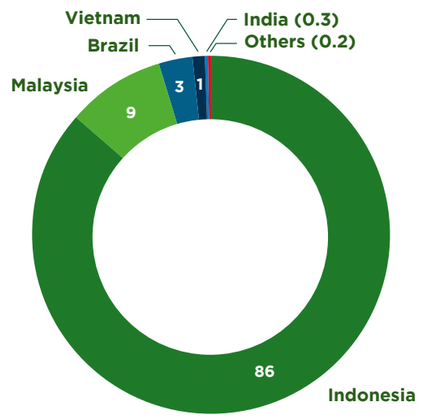


Table 14 The United Kingdom's direct imports of secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	8,900	56.0%
Mouldings	5,100	3.2%
Other joinery	400	3.9%
Windows	10	4.5%
Total	**14,400**	**7.7%**

Exposure to certification

With an estimated 40%–45% (5,800–6,500 tonnes) of the market exposed to certification, the United Kingdom has a relatively large share of secondary tropical wood products exposed to certification. The United Kingdom is the fifth largest importer of secondary tropical wood products exposed to certification in the EU27 + UK and accounts for roughly 9.9% of the total EU27 + UK exposed imports.

Germany

Tropical wood product imports

Germany imported a total of 30,200 tonnes of the selected secondary tropical wood products directly from ITTO producer countries in 2019. Germany is the third largest importer of selected secondary tropical wood products in the EU27 + UK and accounts for roughly 16.1% of the total EU27 + UK direct imports. Germany imports almost exclusively mouldings (30,100 tonnes), approximately 18.7% of the total EU27 + UK imports of tropical mouldings. Germany also imports a very small quantity (100 tonnes) of other joinery. The direct import of tropical doors and windows is practically absent.

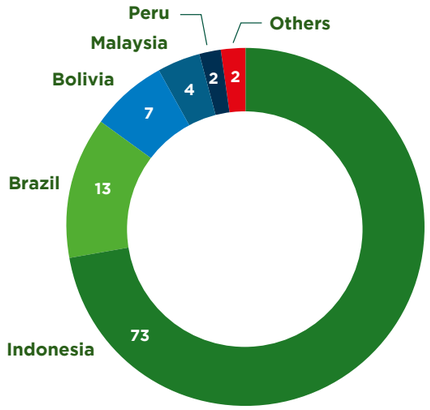
These numbers seem quite small for a country the size of Germany, and interviews with experts and market operators suggest that Germany imports substantial amounts of secondary tropical wood products from fellow EU27 countries (not accounted for in this study). Interviews point to the ports of Antwerp and Rotterdam as main import hubs for selected secondary tropical wood products destined for Germany. Secondary tropical wood products are also imported by truck from countries like Italy, Latvia, and Ukraine. As a result, the German import numbers presented in Table 15 are most likely an underestimation of the total imports. Moreover, interviews suggested that the EU-intra trade has increased after the introduction of the EUTR. Interviews also point to substitution by other materials (wood and non-wood) as explanation for a decline in the share of tropical wood within the market.

Table 15 Germany's direct imports of secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	0	0.0%
Mouldings	30,100	18.7%
Other joinery	100	1.1%
Windows	0	0.0%
Total	**30,200**	**16.1%**

Looking at direct imports from ITTO producer countries, Germany imports almost three-quarters (73%) of its selected secondary tropical wood products from Indonesia. Besides large volumes of mouldings, Indonesia is also almost solely responsible for Germany's import of the other joinery product group (though these volumes are quite small). Brazil, Bolivia, and Malaysia also export significant volumes of secondary tropical wood products to Germany.

Figure 14 Share (%) of the Germany's direct imports of selected secondary tropical wood products by country of origin in 2019



Exposure to certification

Germany's secondary tropical wood product market share exposed to certification is estimated at 15%–30% (4,500–9,100 tonnes). Germany is the fourth largest importer of certified selected secondary tropical wood products in the EU27 + UK — 10.9% of the total certified imports.

Photo Mark van Benthem, Probos

Spain

Tropical wood product imports

Spain is the smallest direct importer of selected secondary tropical wood products (1,300 tonnes total) among the seven main EU27 + UK importing countries and accounts for less than 1% of total imports. Five countries not considered to be major importers of primary tropical timber products in the EU27 + UK (Denmark, Portugal, Poland, Sweden, and the Czech Republic) imported larger volumes of secondary tropical wood products directly from ITTO producer countries in 2019 than Spain.

Mouldings (900 tonnes) were the bulk of Spain's imports, but insignificant compared to total EU27 + UK imports. Other joinery (400 tonnes) accounted for approximately 3.7% of the total EU27 + UK imports, while the other product groups were all less than 1% of EU27 + UK imports.

Spain imports its secondary tropical wood products mainly from Brazil (76%). Indonesia and Peru also export relatively significant volumes of secondary tropical wood products to Spain.

Exposure to certification

Spain has an estimated market share exposed to certification of 10%–15% (100–200 tonnes) for the selected secondary tropical wood products. Only Italy has a lower level of exposure to certification for these products. In total, Spain represents just 0.3% of the total imported secondary tropical wood products exposed to certification in the EU27 + UK. Spain's low certified market share may be explained by the high share of Brazilian imports — Brazil has a very low certified productive natural and semi-natural forest area.

Figure 15 Share (%) of the Spain's direct imports of selected secondary tropical wood products by country of origin in 2019

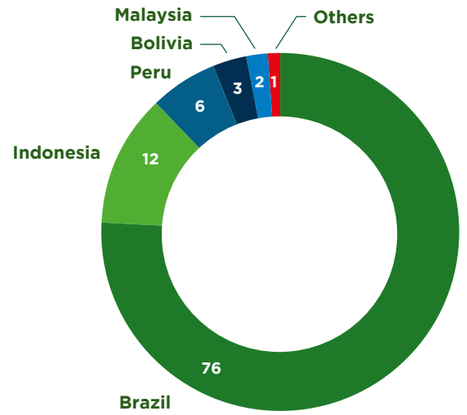


Table 16 Spain's direct import of secondary tropical wood products in 2019

Product group	Secondary tropical wood product import (in Metric Tonnes)	Percentage of total EU27 + UK import
Doors	0	0.1%
Mouldings	900	0.5%
Other joinery	400	3.7%
Windows	0	0.2%
Total	**1,300**	**0.7%**

4 Conclusions

Imports of certified timber drive uptake of Sustainable Forest Management (SFM), a key strategy in halting the clear-cutting of the world's forests, maintaining valuable ecosystems, mitigating climate change, and ensuring sustainable livelihoods for communities in and near forests. In 2019 29%–37% of EU27 + UK direct imports of a selection of secondary tropical wood products (doors, mouldings, other joinery, and windows) from ITTO producer countries were exposed to certification. Imports were concentrated in seven main tropical timber importing countries that together represent 93% of the total EU27 + UK imports. Secondary tropical wood products largely parallel the 2018 data on primary tropical wood products — 25–32% of primary tropical wood products were exposed to certification in 2018, 90% went to seven main importers.

Volumes of secondary tropical wood product imports (187,500 tonnes in 2019) are less than primary tropical wood (1,473,000 tonnes in 2018), but the potential impacts are still significant. Current EU27 + UK demand for certified secondary tropical wood products positively impacts at least 763,000–925,000 hectares of tropical forests. Ramping up demand for SFM-certified products to 100% of imports would impact at least an additional 1,160,000–1,322,000 hectares of tropical forests, and increased demand can have ripple effects. The variety inherent to tropical forests means increased demand for a specific certified species may impact an entire managed area and exports to other countries. Combined with **the 2019 report suggesting that primary tropical timber products had the potential to impact over 16 million hectares, the total potential impact of these combined EU27 + UK markets is enormous. Demanding SFM for all tropical wood products would positively impact over 18 million hectares.** Demand for more sustainably produced secondary products is an important part of a necessary push for increased demand for verified timber in all markets.

Table 17 Overview of the import exposed to certification and FLEGT-Licensed of the 7 main tropical timber importing countries of the EU27 + UK for both primary (2018 data) and selected secondary tropical timber products (2019 data). All figures in tonnes.

	Import		Amount exposed to certification		FLEGT-Licensed	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Belgium	339,000	23,600	84,500–101,500	6,700 – 8,000	22,500	6,900
France	215,000	58,800	21,500 – 32,000	11,800 – 17,600	2,500	2,500
Germany	89,000	30,200	26,500 – 31,000	4,500 – 9,100	44,500	22,000
Italy	135,000	2,600	6,500 – 13,500	100 - 300	6,500	600
Netherlands	189,000	39,700	123,000 - 132,500	28,800 – 27,800	41,000	29,500
Spain	61,000	1,300	1,500 – 4,500	100 - 200	100	100
United Kingdom	106,000	14,400	42,500 – 48,000	5,800 - 6,500	39,000	12,500

SFM in the tropics faces several major challenges that EU27 + UK actors have the leverage to address. Insufficient market demand for both sustainable tropical timber and tropical timber generally (driven by competition from other materials) hamper the growth of SFM. Paired with growing demand for tropical timber from emerging economies with lower environmental concerns, the incentives for SFM are challenged. Ensuring the long-term viability and growth of SFM will require decisive action by EU27 + UK governments, NGOs, and the private sector.

Individual EU27 + UK governments must expand and enforce verified sustainable tropical timber in **procurement policies.** The EU27 + UK's **work in partnership with key supplier countries** via EUTR/FLEGT and **enhancing EUTR enforcement** remains essential to raising the baseline of sustainable forestry. Government to government actions encouraging **emerging economies to enact policies that promote SFM are also crucial to expanding SFM.** Governments can also play a greater role in providing financial or other economic incentives that support the growth of verified sustainable timber products.

The EU27 + UK and NGOs should collaborate to explore the **synergies between EUTR / FLEGT license and forest certification** — it needs be clear that one system is not a substitute for the other.

Private sector actors all along the supply chain including trade associations, buyers, builders, and prescribers can help grow this market by encouraging purchases of sustainable tropical timber products.

All actors must support raising the bar to **100% sourcing of verified sustainable tropical timber products,** and **promote and expand applications of verified sustainable tropical timber** as a material that helps fight against imported deforestation. The development of a harmonized Life Cycle Analysis (LCA) methodology could greatly facilitate uptake by demonstrating the relative environmental benefits of verified sustainable tropical timber.

Lastly, it is essential that this and similar reports continue to grow in accuracy. Support from a number of actors and experts has already refined this process, but increased contributions and collaborations are required to **improve the availability, quality, and transparency of information and monitoring** of verified sustainable tropical timber. International data providers (such as FAO, ITTO, FSC, and PEFC international), private legal verification schemes, national timber trade associations, and the larger operators in the private sector can all support in refining this report. Together we can rally the resources to shift these supply chains and impact tropical forests globally.

Recommendations for future data gathering

This report has sought to bring together the results of the 2019 analysis of primary tropical wood products and a 2020 analysis of a selection of secondary products. While annual market fluctuations are not generally huge, black swan events such as COVID19 can cause enormous changes. **This process should be repeated regularly and include both primary and secondary tropical wood products.**

These annual reports require both trade data and expert insights from those working in the markets. Conducting interviews during the early stages of an evolving pandemic has proven to be very restrictive and reduced the level of participation. **Future studies should not assume that face-to-face meetings will be possible and alternative adapted methods of collecting information should be considered.**

Continuing and expanding current efforts to promote data collection such as the ATIBT/TBI/Probos surveys and the IDH-supported initiative to develop a portal for data collection among European timber trade federation members are important to refining these models. **Continue to conduct surveys of market actors validate and contextualize estimates and assumptions.**

The privately owned and managed legal verification systems have varying levels of transparency. Some are open with reasonable levels of publicly available information regarding the operations that have been assessed, while others offer little information in the public domain. **Private legal verification schemes should aim for the highest levels of transparency at least matching the levels offered by FSC and PEFC.**

By January 1st 2021 the United Kingdom will have completely withdrawn from the European Union. The UK is one of the largest markets for tropical wood products within Europe and is likely to remain so. The UK has passed legislation that matches the EU Timber Regulation and is likely to remain a supporter of the FLEGT process. **Future assessments should continue to include the UK within their scope.**

The EU market remains large, valuable, and capable of driving standards within producer countries. However, other markets have become important to tropical producers and in some cases have begun to drive policy and practice. **Future assessments would benefit from broadening their scope to include domestic markets in producer countries, regional trade, and non-EU international markets.**

This study has revealed that some product groups are of negligible importance to the EU 27 + UK market in terms of volume or value. **Future assessments should consider other additional secondary product groups, while taking into account that the market for secondary products is complex and data availability is low.**

Insight from the main producer countries would enhance knowledge and improve assumptions. **Future assessments should seek input from a wider pool of producer countries to improve insights.**

Intra-trade is not currently included within the scope of this study. Inclusion of intra-EU and trade of raw materials and components would likely reveal consumption patterns that differ from import patterns, and export quantities that vary from land-use. **Future assessments should seek to assess the value of intra-trade and develop an efficacious method to adjust estimates.**

Photo Mark van Benthem, Probos

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Annexes

Annex 1: Steps to calculating exposure to certification

The input data was analyzed to calculate quantities exposed to certification. To provide insight on the calculation process, the steps taken during analysis are explained in detail below.

Step 1: Calculating EU27 + UK tropical timber product imports

STIX import data is combined with Internal Probos data on Tropical Countries and Tropical Timber Products in order to generate an overview of trade flows of the selected secondary tropical wood products. The STIX data contains both intra- and extra-EU27 + UK trade flows, so a selection was made to detect only imports of tropical timber products from ITTO producer countries. As a consequence, EU member state *intra-trade was excluded* from the analysis. Moreover, imports of tropical timber from non-ITTO countries (i.e. China) are *outside the scope of this study.* As direct imports cover the vast majority of secondary tropical wood products that enter the EU27 + UK, the consequences of excluding indirect trade are considered to be limited. For example, imports of secondary tropical wood products from China (the largest exporter outside ITTO producer countries) were estimated to be only 5% of imports from ITTO producers in 2019.

Next, STIX data are combined with global export data of Tropical Timber Products of the ITTO (this explains why the analysis only includes imports from ITTO countries). For tropical doors (HS 44182010), mouldings (HS 4409220), and windows (HS 44181010), the selection of tropical products is straightforward since these product codes explicitly state that these products are made out of tropical timber. However, the product group 'other joinery' (HS 44189990) contains both tropical and non-tropical timber products. In order to correct for this, a ratio of tropical/non-tropical products was generated for each ITTO producer country based on export quantities of doors, mouldings, and windows (both tropical and non-tropical) to the EU27 + UK. Multiplying this ratio with the total export of 'other joinery' to the EU27 + UK gives an estimate of the share tropical timber within the product group of other joinery.

Step 2: Determining productive forest area in tropical countries

The focus of the study is solely on natural and semi-natural tropical forests (we have actively sought to exclude material from plantations). In order to determine the productive area of natural and semi-natural tropical forests in the ITTO tropical timber producing countries, several data sources have been used. The main source is FAO data on *Industrial Concessions Areas*, which is assumed to represent the productive forest area within a specific country. Where not available, FAO `production forest area' (as stated in FRA 2015) as "productive forest" was used.

The published areas for natural or semi-natural tropical forests contain significant areas within them that are not being exploited or allocated to concessions or other forest management units, and also include significant areas that are not in production (such as riparian zones, high conservation value zones (HCV's), roads, villages, rivers, protected areas, buffer zones etc.). We assume a modest correction of -20% to correct for the overestimation of the productive forest area.

Step 3: Determining certified forest area, VPA status, and presence of verified legal systems in tropical countries

The data available on the FSC and PEFC websites (facts and figures sections, gathered in May 2020) was used to determine the certified area of natural and semi-natural forests within all tropical countries. A distinction was made between FSC only, PEFC only, and Dual certified areas to avoid double counting. FSC and PEFC certified plantation areas have been deducted from certified forest areas as a result of analysis of product scope (for example where pine or eucalyptus are the primary species) and a review of audit reports. The division of ITTO producer countries into continental regions is presented in Annex 3.

Next, the **FLEGT status** was determined for each ITTO producer country in line with the divisions in the FLEGT Independent Market Monitor.[42] The three categories are: FLEGT-Licensing country, VPA implementing country, and VPA negotiating country (Annex 4).

Additionally, the forest area operating under a **third party legal verification scheme** was assessed for each ITTO producer country. In this analysis the following verified legal systems were included: Timber Origin and Legality (OLB, Bureau Veritas), Timber Legality Verification (TLV, Control Union Certifications), FSC Controlled Wood (FSC-CW), and LegalSource (NEPCon). Other private schemes exist but they do not routinely publish data on current status, scope, or coverage of their scheme. As a result, any calculations and estimates made using the data for verified legal systems are only partial.

Step 4: Share of forest area certified and legally verified in tropical countries

Dividing the certified natural and semi-natural forest area with the total productive forest area, results in the % of the total productive forest area that is FSC and/or PEFC certified per country. The same was done for the verified legal schemes.

Step 5: Calculate total exports exposed to certification and legal verification

In order to calculate the total secondary exports to EU27 + UK exposed to certification we needed to know the total volume of secondary products exposed to certification for each producer country. We did this by projecting the ratio of certified to non-certified land calculated in Step 4 onto the total volume of secondary products produced in a country.

Calculating the total volume of secondary products produced in a country is complicated as the ITTO database does not contain this information and there is a general lack of production data. We calculated a best estimate using available data and a few assumptions. For each ITTO producer country we calculated the ratio of global exports of primary tropical timber products to exports of primary tropical timber products to the EU27 + UK. This ratio was then applied to the ITTO country's exports of the selected secondary products to the EU27 + UK (from STIX data) to generate an estimate of the global exports of the selected secondary tropical wood products from a given producing country.

Subsequently, this quantity was multiplied by the % of the total productive forest area that was FSC and/or PEFC certified. This calculation results in a total export quantity of secondary tropical timber products **exposed to certification by producing country.**

A similar calculation was performed for the exports of products exposed to legal verification. The results of the surveys among the main producers conducted as a part of this study showed that the raw materials used to manufacture the secondary tropical wood products originated almost exclusively from the producing country itself, so no corrections for country of origin were made.

Step 6: Calculate exports to EU27 + UK exposed to certification and legal verification
Backed by limited data from various sources, and GTF and Probos expert knowledge and field experience, we assume that 50% to 80% of all certified tropical timber is imported to Europe along existing trade flows. This assumes that European markets have the greatest demand for certified products and that tropical producers who are certified tend to be looking to and be led by their European customers. Not all tropical producer countries will fit this pattern, but there is some evidence (especially from the Congo Basin and Southeast Asia) to back up this assumption.

Multiplying the total export of tropical timber products per tropical country with 50% or 80% establishes the lower and upper boundary of the export quantity to the EU27 + UK exposed to certification. In some cases the total exports exposed to certification/verification of a certain tropical country exceeded the total EU27 + UK imports from that country. In this case, we assumed that 50%–80% of the EU 27 + UK imports from that country are certified. These export quantities to EU27 + UK exposed to certification are compared to STIX data on total exports to EU27 + UK to establish a rate of exposure to certification for each producing countries' exports to the EU27 + UK.

For the import of secondary tropical wood products exposed to a verified legal scheme, the share of forest area exposed to a verified legal scheme per country (calculated in step 3) has been multiplied with the total import of the EU27 + UK from the respective producing country.

Step 7: Validating the outcome for EU27 + UK and 7 main tropical timber importing countries
Interviews with some of the main actors in the main EU27 + UK tropical timber consuming countries, (limited) existing data, and GTF and Probos internal knowledge helped validate the outcome of the exposure method.

The range of certified tropical timber imports is estimated for the 7 main EU27 + UK tropical timber importing countries based on the interviews with national experts. Note that the 7 main EU27 + UK tropical timber importing countries are chosen based on *total* tropical timber imports rather than secondary tropical timber product imports. Hence the countries are the same assessed in the 2019 report concerning primary tropical timber products. The 7 main importing EU countries represent over 90% of the total secondary tropical timber imports of the total EU27 + UK region. Multiplying the estimated share of certified tropical timber imports of these 7 EU27 + UK member states with their total tropical timber imports from ITTO producer countries provides an estimation of certification exposure, not source-based but receiver-based. This final step of validation allows for a market perspective to be applied to the estimation process which for the first 6 steps is largely a mathematical process.

Step 8: Determining the additional certified forest area required to sustain 100% certified EU27 + UK demand of secondary tropical timber products
STIX import data are used to determine the total 2019 demand for secondary tropical timber by the EU27 + UK. These data are expressed in metric tonnes and are recalculated into roundwood-equivalents (RWE) using internationally accepted conversion factors in order to compare the import figures to the harvested quantities within the producer countries.[43]

Subsequently, the total import quantity and share of certified quantity was calculated for each geographic region. The share of certified quantity for each region is calculated with the use of the exposure to certification figures from each country. Shares of certified and non-certified quantities have been calculated for both the lower (50%) and upper (80%) boundaries of exposure to certification (see step 6).

This report calculated the average yield per hectare of certified sustainable forests for each of the identified continental regions in order to calculate the forest area needed to meet total EU27 + UK demand. For this calculation (limited) available data on harvest levels in certified concessions in tropical producer countries were used. These data were derived from certification audit reports, questionnaires amongst concessionaires, and regional and national offices of the FSC and the PEFC. Based on these data, a weighted average harvest level (based on the actual harvest volume within the total certified forest area in a year) in certified forest concessions per region was calculated taking into account rotation cycles. This resulted in the following average yields: Africa — 0.26 m^3/ha/yr, Latin America — 0.48 m^3/ha/yr, Asia — 0.59 m^3/ha/yr.

To account for the fact that the entire harvested volume is not of export quality it is assumed that 75% of the yield meets exports requirements for primary timber products like plywood and sawn timber.[44] For secondary timber products, it assumed that 55% of the yield meets product quality requirements. The average yield for each region was adjusted accordingly and used to calculate the additional forest area to meet 100% of the 2019 demand of the selected verified sustainable secondary tropical wood products of the EU27 + UK. A similar analysis was performed solely for the 7 main EU tropical timber importing countries.

Annex 2: Product coverage of primary tropical timber products

Product Group	Product Code	Description
Tropical Doors	44182010	Doors and their Frames and Thresholds of tropical timbers.
Tropical Mouldings	44092200	Tropical wood continuously shaped along any of its edges, ends or faces, whether or not planed, sanded or end-jointed
Other tropical Joinery	44189990*	Builders' Joinery And Carpentry of tropical Wood
Tropical Windows	44181010	Windows and French Windows and their Frames of tropical wood

*This productcode does not distinguish between tropical and non-tropical products. In order to make this distinction an analysis has been performed based on the ratio of tropical/non-tropical products of doors, mouldings and windows per partner country.

Annex 3: Division of ITTO producer countries by geographic regions

Region	Africa	Asia	Latin America
Country	Benin	Cambodia	Bolivia (Plurinational State of)
	Cameroon	Indonesia	Brazil
	Central African Republic	India	Colombia
	Republic of Congo	Malaysia	Costa Rica
	Côte d'Ivoire	Myanmar	Ecuador
	Democratic Republic of the Congo	Papua New Guinea	Guatemala
	Gabon	Philippines	Guyana
	Ghana	Thailand	Honduras
	Liberia	Viet Nam	Mexico
	Madagascar		Panama
	Mozambique		Peru
	Nigeria		Suriname
	Togo		Trinidad and Tobago
			Venezuela (Bolivarian Republic of)

Annex 4: Country division based on VPA status

VPA status	Country
FLEGT-Licensing	Indonesia
VPA implementing country	Cameroon
	Central African Republic
	Ghana
	Liberia
	Republic of Congo
	Vietnam
VPA negotiating country	Cote d'Ivoire
	Democratic Republic of Congo
	Gabon
	Guyana
	Honduras
	Laos
	Malaysia
	Thailand

Annex 5: Conversion factors

Product Group	Tonne to m^3 product	m^3 product to m^3 RWE
Tropical Doors	1.4	3
Tropical Mouldings	1.3	2.21
Other tropical Joinery	1.4	3
Tropical Windows	1.4	3

Footnotes

1 White, G. van Benthem, M. Oldenburger, J. & Teeuwen, S. (2019) *Unlocking sustainable tropical timber market growth through data.* IDH The sustainable trade initiative.

2 White, G. van Benthem, M. Oldenburger, J. & Teeuwen, S. (2019) *Unlocking sustainable tropical timber market growth through data.* IDH The sustainable trade initiative.

3 EU 28 imports of Sawnwood and Plywood from tropical hardwood: €810 million in 2019. EU 28 imports of Wood doors and Windows from tropical hardwood: €570 million in 2019. Source: https://stats.flegtimm.eu/

4 White, G. van Benthem, M. Oldenburger, J. & Teeuwen, S. (2019) *Unlocking sustainable tropical timber market growth through data.* IDH The sustainable trade initiative.

5 Van Benthem et al. (2018). How sustainable are Europe's tropical timber imports? *Estimating the market share of verified sustainable tropical timber on the European market.* IDH The sustainable trade initiative. https://bit.ly/32XuZnX.

6 International Tropical Timber Organisation (2018) *Biennial review and assessment of the world timber situation 2015-2016.* ITTO, Yokohama, Japan. ISBN 978-4-86507-035-4

7 Data from FLEGT Independent Market Monitor. Download of `EU member imports of all wood products in HS 44 from VPA partner countries: quantity in metric tonnes'. http://www.stats.flegtimm.eu/

8 Includes: Plywood, Veneer, Roundwood & Plywood. See White et al (2019) *Unlocking sustainable tropical timber market growth through data* for a breakdown by HS code.

9 OECD (2020) www.oecd.org/coronavirus/en/ June 10th 2020. Note all economic prediction taken from this source.

10 Statista (2020) *What Share of the World Population Is Already on COVID-19 Lockdown?* (April 23rd 2020) https://bit.ly/304g4qa

11 BBC (2020) *Coronavirus: Chinese economy bounces back into growth.* www.bbc.co.uk/news/business-53399999

12 The EU's 'Summer 2020 Economic Forecast,' published in July 2020, suggests that the EU economy will "experience a deep recession this year due to the coronavirus pandemic." As the lifting of lockdown measures is proceeding at a slower pace than assumed in the Spring Forecast, the impact on economic activity in 2020 is expected to be more significant than previously anticipated. The EU forecast projects that the euro area economy will contract by 8.7% in 2020 and grow by 6.1% in 2021. The EU economy is forecast to contract by 8.3% in 2020 and grow by 5.8% in 2021. Global growth is projected at -4.9% in 2020, 1.9 percentage points below the April 2020 World Economic Outlook (WEO) forecast, published by International Monetary Fund (IMF), 2020.

13 Data collated from multiple sources: *ITTO Tropical Timber Market Report:* Volume 24 Number 7, 1st–15th April 2020; Volume 24 Number 9, 1st–15th May 2020; Volume 24 Number 10, 16th – 31st May 2020; FAO Forestry Week seminars June 24 & 25 2020; FAO (2014) *Contribution of the forestry sector to national economies*, 1990-2011, by A. Lebedys and Y. Li. Forest Finance Working Paper FSFM/ACC/09. FAO, Rome

14 Linhares-Juvenal, T. (2020) *Covid-19 impacts on wood value chains*. Forest Governance and Economics, Forestry Policy and Resources Division, Food and Agriculture Organization of the United Nations, FAO Sustainable Wood for a Sustainable World (SW4SW); Annie Ting, Sarawak Timber Association, Malaysia; Ivan Tomaselli, STCP, Brasil; Francoise van de Ven, General Secretary of UFIGA, Gabon. Presentations at FAO Forest Week - June 24th 2020; ATIBT / BVRio (2020) *Analysis of the Social and Economic Impact of COVID-19 on the Forestry Sector on the Republic of Congo*. https://bit.ly/3j2QEkn

15 Not all countries closed milling operations. For example, US mills were / are exempt from closure as they are considered a critical part of the national supply chain

16 ITTO (2020) *ITTO Tropical Timber Market (TTM) Report.* Volume 24 Number 13, 1st – 15th July 2020

17 ITTO (2020) *ITTO Tropical Timber Market (TTM) Report.* Volume 24 Number 13, 1st – 15th July 2020

18 ITTO (2020) [B] *ITTO Tropical Timber Market (TTM) Report*: 24 Number 17 1st – 15th September 2020

19 https://www.thefis.org/cpa-publishes-its-construction-industry-scenarios-2020-21/ CPA Construction Industry Scenarios Published August 2020

20 Financial Times (24th July 2020) *The German housing-market exception*. www.ft.com/content/cb004fce-5787-48c9-bc5d-3c27e890a76c

21 ITTO (2020) [B] *ITTO Tropical Timber Market (TTM) Report:* 24 Number 17 1st – 15th September 2020

22 FSC attempted to address this through the Online Claims Platform, however there was little support for this initiative.

23 WWF UK (2014) *In or out? Can the European Union's Timber Regulation keep out illegal timber?*; European Union (2013) HS Codes identified within: *Commission Implementing Regulation (EU) No 1001/2013 of 4 October 2013 amending Annex I to Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff*

24 White, G (2018) *ITTO Technical Series #47 - EU furniture market attitudes to FLEGT licensed timber* (ITTO)

25 White, G. van Benthem, M. Oldenburger, J. & Teeuwen, S. (2019) *Unlocking sustainable tropical timber market growth through data.* IDH The sustainable trade initiative.

26 Proforest (2011). *An overview of legality verification systems.* https://bit.ly/3i9alR1

27 Other schemes exist but information regarding certificates issued was not available.

28 STIX is a joint initiative of The International Tropical Timber Organisation (ITTO) and the Global Timber Forum (GTF) and provides access to data on timber products trade as reported by the statistical agencies of 46 countries including nearly all the world's largest exporters and importers: https://stix.global/

29 Data from the PRODCOM database

30 Eurostat (2016). *Manufacture of wood and wood products statistics*. Nace Rev. 2. https://bit.ly/2FPG4iu

31 The International Tropical Timber Organization (2019). *Tropical Timber Market Report.* Volume 23, number 15. https://bit.ly/2GabAqX

32 ITTO IMM (2019). https://stats.flegtimm.eu

33 Storck et al. (2019). *FLEGT VPA Partners in EU Timber Trade 2018*. ITTO The International Tropical Timber Organization. https://bit.ly/2FOkwTr

34 Timber industry news (2018). https://bit.ly/33Zpx-Ak

35 Eurostat (2020). *Statistics on the production of manufactured goods*. https://bit.ly/3hXpKZR

36 Coniferous wood Prodcom-code 16102110, non-coniferous wood Prodcom-code 16102300, product codes include both decking products and interior decorative products like molded skirting board and beading

37 Storck et al. (2019). *FLEGT VPA Partners in EU Timber Trade 2018*. ITTO The International Tropical Timber Organization. https://bit.ly/2FOkwTr

38 The International Tropical Timber Organization (2019). *Tropical Timber Market Report*. Volume 23, number 15. https://bit.ly/2GabAqX.

39 The area of PEFC certified semi-natural and natural forest in Brazil is double (FSC and PEFC) certified and currently does not sell wood products with a PEFC-certificate.

40 Probos' internal figures.

41 Van der Heyden, D., De Somviele B., Van Benthem, M., Oldenburger, J., Kremers J., Bilsen V. (2018). *Gecertificeerd hout op de Belgische markt in 2016. Marktstudie, perspectieven en aanbevelingen voor een herziening van het bestaande Sectoraal Akkoord.* https://bit.ly/32WqTMU

42 FLEGT IMM (2019). https://bit.ly/2G26mxI

43 FAO, ITTO and United Nations (2020) Forest product conversion factors. Rome. https://doi.org/10.4060/ca7952en

44 Van Benthem et al. (2018). *How sustainable are Europe's tropical timber imports? Estimating the market share of verified sustainable tropical timber on the European market.* IDH The sustainable trade initiative. https://bit.ly/32XuZnX.

45 Sasaki N, Asner GP, Pan Y, Knorr W, Durst PB, Ma HO, Abe I, Lowe AJ, Koh LP and Putz FE, (2016) *Sustainable Management of Tropical Forests Can Reduce Carbon Emissions and Stabilize Timber Production.* Frontiers in Environmental Science. 4:50., https://doi.org/10.3389/fenvs.2016.00050

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trade initiative