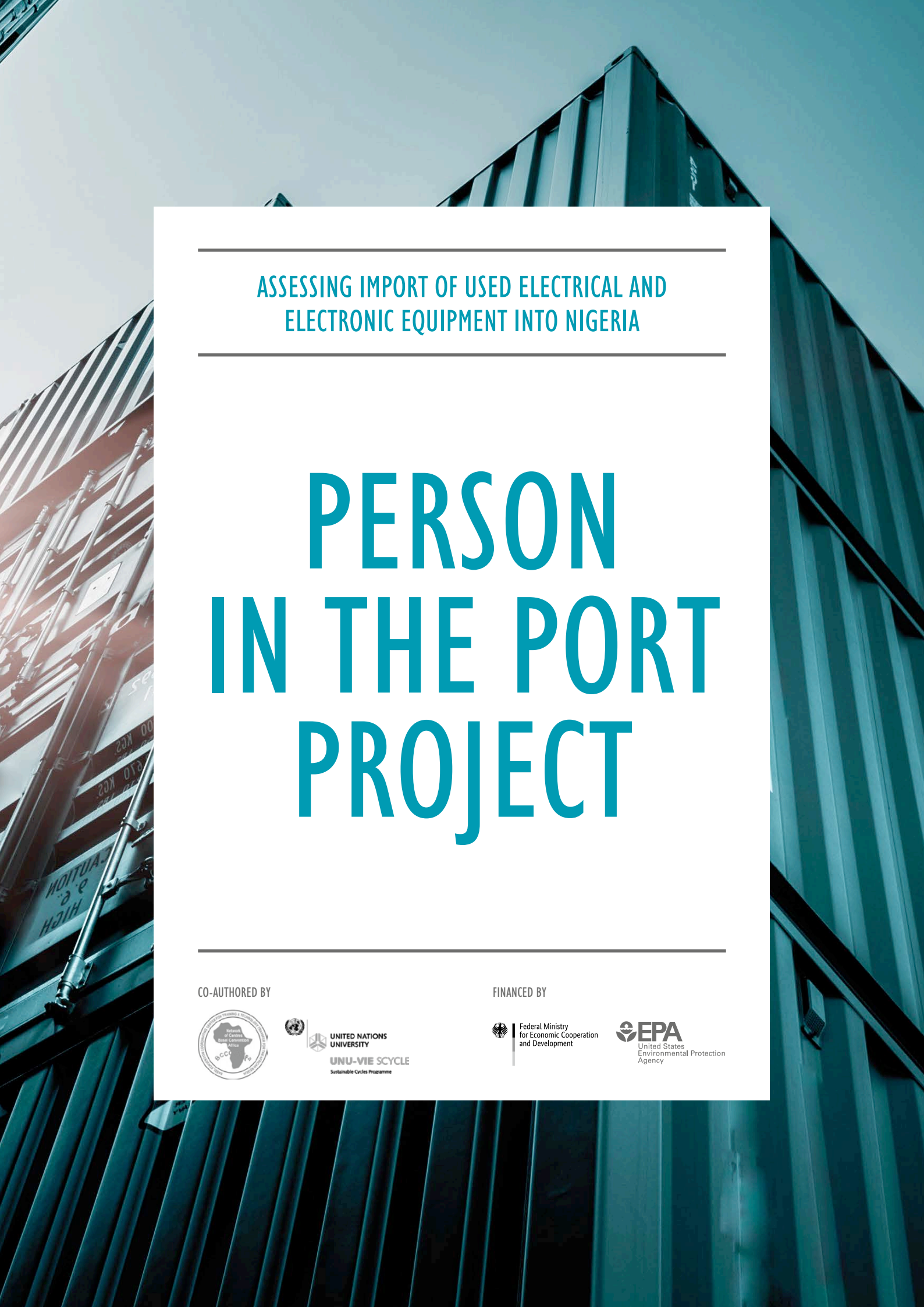

ASSESSING IMPORT OF USED ELECTRICAL AND ELECTRONIC EQUIPMENT INTO NIGERIA

PERSON IN THE PORT PROJECT

CO-AUTHORED BY

Network of Centres Basel Convention Africa

UNITED NATIONS UNIVERSITY

UNU-VIE SCYCLE

Sustainable Cycles Programme

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DISCLAIMER

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ACRONYMS

ASYCUDA	Automated System for Customs Data
BoL	Bill of Lading
CMR	Cargo Movement Requirement
CRT-TV	Cathode Ray Tube Television
EEE	Electrical and Electronic Equipment
EOL	End-of-life
(H)CFCs	(Hydro-)chlorofluorocarbons
LPCA	Lagos Port Complex Apapa
NCS	Nigeria Customs Service
NESREA	National Environmental Standards and Regulations Enforcement Agency
NPA	Nigeria Ports Authority
PAAR	Pre Arrival Assessment Report
PiP	Person in Port
PiP1	Person in Port phase 1 (January 2015-June 2015)
PiP2	Person in Port phase 2 (July-December 2016)
PTML	Ports and Terminal Multiservice Ltd.
RoRo	Roll-on/roll-off
SUEEE	Suspected used electrical and electronic equipment
UAE	United Arab Emirates
UK	United Kingdom
TCIPC	Tin Can Island Port Complex in Lagos
TISU	Term(s) indicating suspected used electrical and electronic equipment
SM	Shipping manifest
StEP	Solving the e-waste problem Initiative
UAE	United Arabian Emirates
UEEE	Used Electrical and Electronic Equipment
UNU	United Nations University
US–EPA	United States Environmental Protection Agency
WEEE	Waste Electrical and Electronic Equipment

DEFINITIONS

E-waste
"E-Waste is a term used to cover items of all types of electrical and electronic equipment (EEE) and its parts that have been discarded by the owner as waste without the intention of re-use." [1]

Roll-on Roll-off
Shipping mode in which the cargo are driven on and off the vessel. In RoRo, the ships are designed to carry wheeled cargo, such as automobiles, trucks, semi-trailer trucks, trailers, tractors, buses, which are driven on and off the ship on their own wheels, or oversized cargo loaded on special flatbeds, trailers or using a platform vehicles, such as a self-propelled modular transporters.

Country of Origin of UEEE
Country in which the port of export is located.

UEEE
EEE which was used but is still workable and keeps its original form, or can be repaired, modified, reconditioned in order to be used for the same as the original purposes. [2]

[1] UNU/StEP, 2014a, b

[2] http://bcrc-sea.org/bcrc_ewaste/index.php/national_eee/definition/9)

SUMMARY

This report presents the method and results of the inspection of containers and vehicles, and the review of import documents, associated with UEEE imports via the Tin Can Island Port Complex (TCIPC) and the Lagos Port Complex Apapa (LPCA), the two hubs for UEEE imports in Nigeria, in 2015 and 2016. The person in the port (PiP) inspected 201 containers and 2,184 roll-on/roll-off (RoRo) vehicles with used electrical and electronic equipment (UEEE), and reviewed 3,622 import documents of UEEE in containers. The containers with imported UEEE represent around 0.7% of all containers with goods imported via the LPCA and the TCIPC in 2015 and 2016. Thus, on average, 1 out of 143 imported containers was found to contain UEEE.

It was observed that UEEE of virtually all categories (except automatic dispensers) are imported into Nigeria, often mixed with other goods such as sewing machines, bicycles, kitchenware, sports equipment, and other household items/furnishings. UEEE are imported in containers with and without vehicles, and are stuffed inside roll-on/roll-off (RoRo) imported used vehicles.

Overall, the data from inspections and from the review of import documents point to around 60,000 t of UEEE imported in 2015 and 2016 respectively, via the LPCA and the TCIPC. The import of UEEE in RoRo-imported vehicles was found to be the main UEEE import route. It was assessed to be 41,500 t per year, which could be higher or lower depending on the ratio of cars to trucks and bus imports. This result is dependent on the portion of the various vehicle types in the total number of RoRo-imported vehicles. In the absence of further hard data, it was impossible to calculate a reliable range of these UEEE imports, although the UEEE import in RoRo vehicles in all uncertainty scenarios remains a main, or at least a highly relevant, import route.

The UEEE imports in containers were assessed to be around 18,300 t per year. The container imports were further categorised as imports in containers without vehicles and imports in containers with vehicles. Around 9,500 t of UEEE were imported in containers with vehicles in 2015 and 2016 respectively, another 8,800 t in containers without vehicles. The 18,300 t of UEEE imports found to be imported in containers are equivalent to about 0.2% of the weight of all goods imported in containers via the LPCA and TCIPC in 2015 and 2016. Due to suspected underdeclaration of the weight of imported goods and missing import documents, the 18,300 t of UEEE imports in containers should be considered a minimum. Uncertainty analyses show, however, that compared to the UEEE imports in RoRo-vehicles, the overall import volume of UEEE is only slightly sensitive to changes in the number of imported containers with UEEE and to potential underdeclaration effects. The data uncertainties related to the import of UEEE in containers is therefore not expected to crucially increase the assessed overall volumes of imported UEEE.

Additional imports of UEEE arriving via other channels, e.g. across land borders from neighbouring countries or in luggage via airports, could not be taken into account but are assumed to be of less importance due to the higher effort and costs related to imports of larger UEEE quantities.

Overall, most imported UEEE originated from ports in Germany (around 20%) followed by the UK (around 19.5%) and Belgium (around 9.4%). The Netherlands (8.2%), Spain (7.4%) China and the USA (7.3% each) are next in the ranking of main exporters, followed by Ireland (6.2%). Overall, these eight countries account for around 85% of UEEE imports into Nigeria. EU member states were the origin of around 77% of UEEE imported into Nigeria.

For UEEE in RoRo-vehicles; Germany (28%), UK (24%), Belgium (13%), The Netherlands (12%), Ireland (9%), and Spain (5%) are the main exporters to Nigeria. The EU member states account for 98% of these UEEE imports, with the rest coming from the USA.

China leads the export of UEEE in containers. Around 24% of these UEEE imports originated in China, followed by the USA (20%), Spain (12%) and the UK (9%). Around 29% of UEEE imports in containers were exported from ports located in EU member states. As for UEEE imports in containers without vehicles, China is the largest exporter (44% of these imports), followed by the UK (8%), USA (6%), Spain (5.1%) and Hong Kong (5%). The EU member states were the origin of around 24% of these imports into Nigeria.

The USA (32%) leads the exports of UEEE in containers with vehicles followed by Spain (19%), the UK (9%), China (6%) and Morocco (5%). The EU member states account for around 34% of the UEEE imports in containers with vehicles.

Although the Nigerian Government has banned the import of CRT-devices, around 260 t were found to be imported annually. The main sources of these CRT-TVs were China (23%), USA (15%), UK and Spain (14% each), Italy (8%), Hong Kong and the Netherlands (4% each). These six countries accounted for about 80% of the total CRT imports.

The inspection of the 201 containers showed that 80% of the imported containers carried clean UEEE. Only 40% of the imported UEEE was properly packaged. Nevertheless, around 80% of the devices were found undamaged during visual inspection. A basic functionality testing of 760 devices of 9 different UEEE types, which represent 60% of all UEEE imported in containers (by weight), showed that, depending on the UEEE type, a minimum of around 5% (pressing irons, photocopiers) to 55% (LCD-TVs) of the tested devices were nonfunctional. On average, a minimum of around 19% of the 760 devices tested were nonfunctional.

The test result must be interpreted as absolute best case scenario because only the basic functionalities could be tested due to time and accessibility constraints. For the same reason, UEEE imported in RoRo-vehicles could not be tested at all, but at least 60% to 70% were found to be clean. The test results suggest that Nigeria imports at least 4,800 t of non-functional UEEE annually in containers, and around 10,800 t in RoRo-vehicles, amounting to at least 15,600 t every year. Nigeria imports at least 690 t of defect refrigerators in containers, or 2,300 t in total, including the imports in RoRo-vehicles every year. Air conditioners amount to 440 t (1,500 t incl. RoRo-imported UEEE). Both refrigerators and air conditioners may contain environmentally hazardous (hydro-) chlorofluorocarbons ((H)CFCs). Part of the 1,800 t (5,900 t with RoRo-UEEE) of LCD-TVs imported per year will contain mercury in cold cathode fluorescent lamps (CCFL) backlights, which requires special treatment.

Based on the functionality testing sample, UEEE containing hazardous substances are among the products with the highest non-functionality rates and the highest import volumes. Since the above results present the best case scenario, the actual volumes of nonfunctional UEEE imports are probably higher than these estimates suggest, although some of these devices can and will be repaired in Nigeria. Nevertheless, under the provisions of the Basel Convention, the export to and the import of nonfunctional UEEE into Nigeria are illegal.

The imports of UEEE can generate considerable profits, especially if they can be sold primarily for re-use. The overall profits depend on the quality and the brand of the UEEE, and on the exchange rate of the Nigerian currency, the Naira, in particular with the US-Dollar and the Euro.

Almost all importers are Nigerians; more than 80% are located in the Lagos area. Importers have to register at the Nigerian National Environmental Standards and Regulations Enforcement Agency (NESREA). This is a precondition for effective implementation of the Nigerian regulations and guidelines, which prescribe the responsibilities of manufacturers and importers of EEE for e-waste management. In total, however, registered importers initiated only around 3% of UEEE imports.

The results show that legal compliance is still a severe problem. Even though the export/import of e-waste is banned by the Basel Convention, it still presents a considerable share of the incoming imports, and banned products like used CRT-devices were also found to be imported. In none of the inspected cases were there any consequences, neither for the exporters nor for the importers. The enforcement of regulations in the countries of export, mainly in the EU and in Nigeria, need to be tightened, and closer cooperation is highly advisable.
It could be helpful to make certificates of functionality testing an obligatory part of the import documents that are required for the transport of goods from the exporting to the importing countries. The shipping lines could then additionally be legally obliged to only accept containers and RoRo-vehicles carrying UEEE that have such certificates. The currently low risk of being controlled may encourage exporters and importers to forego such testing. Making testing certificates an obligatory part of the shipping documents would also require a standard functionality test for each type of UEEE that is accepted by both exporting and importing countries.

The results of the PiP project were presented to the Nigerian Government in a workshop in May 2017. It was agreed to try and set up a working group that includes key actors in Nigeria: Federal Ministry of Environment, Nigerian Customs Service (NCS), NESREA, Nigeria Ports Authority (NPA), UEEE importers, Recyclers, Academia, NGOs, Police, with support from BCCC Africa. The core intention of the working group is to work with motivated and benevolent representatives in the various competent authorities, along with other stakeholders, to make changes to the system and move towards a better prevention of e-waste imports. The group could also be the nucleus of a permanent working group that addresses challenges and promotes the implementation of solutions for sound e-waste management in Nigeria.

As for enforcing the importers' registration obligations at NESREA – and in light of an extended producer responsibility scheme for e-waste management in Nigeria – a better and more effective cooperation between NESREA and NCS was seen to be essential. Exporting countries could be requested to assist in identifying and doing business with only those importers into Nigeria who are properly registered. Strengthening the capacity of the Nigerian National Toxic Waste Dump Watch Committee could be a valuable step to better monitor clandestine importations and dumping of e-waste and other hazardous wastes, and to better enable NESREA to send back such imports to the port of origin.

It was also discussed to reactivate the West African Network for Environmental Compliance and Enforcement (WANECE), which aimed at capacity building in West African environmental institutions and with officials to adequately enforce environmental regulations. The WANECE, as well as the working group to be established in Nigeria, could cooperate with international organisations – like Interpol and Impel who are involved in the prevention of e-waste exports from the EU and other parts of the world – in order to enable the trade of functioning UEEE and to prevent e-waste exports.

1 INTRODUCTION

Like other developing countries and countries with market economies in transition, Nigeria witnesses the import of large quantities of used electrical and electronic equipment (UEEE). Previous studies provided information on the volumes, types, and, in part, the functional status of such imported UEEE.

Table 1 gives an overview on studies and data concerning the import of UEEE and e-waste into Nigeria.

TABLE 1

Source	Estimated Quantities and Qualities of Imported UEEE	Year of Study	Comments on data sources and reliability
Basel Action Network (BAN) - The Digital Dump: Exporting Re-use and Abuse to Africa (BAN, 2005) www.ban.org	500 containers of computer scrap of various age enter Nigeria every month	2005	• Data were obtained from UEEE experts and traders • The research goal was to create laudable awareness • Empirical studies were limited
ÖKOPOL – Institute for Environmental Strategies: Transboundary shipment of waste electrical and electronic equipment/ electronic scrap – Optimization of material flows and control (UBA, 2010) http://www.umweltbundesamt.de/sites/default/files/medien/461/publikationen/3933.pdf	Total import to Nigeria in 2006 was estimated at 2,885,999 tonnes (NBS, 2008, and authors calculation) 536,475 tonnes were imported from Germany in year 2006. [NBS, 2008 and authors calculations]	2010	• The estimates were country-based (export from Hamburg port in Germany to Nigeria) • There was no consistent data because codes for UEEE were not available • Disparity in source of statistical data: Nigeria's declaration of quantities for import from Germany was different from the declaration from the Germany Federal Statistic Office on export to Nigeria • The data did not differentiate between EEE and UEEE
E-waste Country Assessment Nigeria (Ogungbuyi et al., (2012) http://www.basel.int/Portals/4/Basel%20Convention/docs/eWaste/EwasteAfrica_Nigeria-Assessment.pdf	600,000 tonnes of UEEE imported, about 30% of which were nonfunctional	2010	• Port survey covered a time of 2 months and data were gathered at a time when stronger enforcement by the Nigerian government made it less attractive to import UEEE. • The custom data were inconsistent • Data did not distinguish between UEEE and EEE
Waste Crimes, Waste Risks: Gaps and Challenges In the Waste Sector (UNEP, 2015) http://www.unep.org/newscentre/default.aspx?DocumentID=26816&ArticleID=35021#sthash.9J7R9wSr.dpuf	About 60% to 90% of waste was illegally traded or dumped	2015	

The above information on amounts, qualities, and origin of UEEE imports into Nigeria is not fully consistent as it is partially based on anecdotal information and reliant on an unclear and complex data situation. The officially available import data do not differentiate between new EEE and UEEE, and there generally is great uncertainty about the actual share of e-waste in the UEEE imports. The Basel Convention Coordinating Centre for the African Region in Ibadan, Nigeria, and the United Nations University in Bonn, Germany therefore initiated the StEP project "Person-in-the-Port" (PiP), with funding and support from US-EPA, the German Senior Expert Service, and the Electronic Recyclers International (ERI) in Fresno, USA to obtain more reliable information about quantities and qualities of the UEEE imports into Nigeria.

The project hired an expert (referred to as Person in the Port, or PiP) for the assessment of UEEE imports via the Tin Can Island Port Complex (TCIPC) and Lagos Port Complex Apapa (LPCA) in Lagos, Nigeria, which are the hubs of UEEE imports in Nigeria. Due to unexpected restrictions concerning access to the ports, in particular at LPCA, the field inspection period was, however, too short to obtain sufficiently consolidated data on the importation of UEEE into Nigeria during the first phase of the project (PiP1).

Consequently, the period of the project was extended with funding from the German Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

This second project period (PiP2) facilitated additional inspections of containers and vehicles from July to December 2016, and additional reviews of import documents over the time periods January to April 2015 and January to December 2016. The data base created in PiP1 could thus be extended and consolidated.

2 OBJECTIVES AND APPROACH

2.1 Objectives

The objectives of the PiP project were to accomplish the following:

- Assessment of quantities, qualities, composition, and origin of UEEE imports via the ports of Lagos, the Tin Can Island Port Complex[3] (TCIPC), and the Lagos Port Complex[4] Apapa (LPCA) to obtain representative and reliable data;
- Insights into the economic dimensions of the imports;

The information collected provides an opportunity to understand the scope of the problem in Nigeria: how imports are characterized (in terms of what is stated in the shipping documents versus what is really in the containers), the economic drivers influencing UEEE imports, and the prevalence of illegal practices (e-waste importation). The information helps to inform global and national stakeholders who are not aware of the actual conditions of the imports from developed countries, and also to analyse the information from the perspective of making recommendations on how to improve the quality of imports to Nigeria and other developing countries. For a country like Nigeria, it is important to maintain the economic and social benefits of lower-cost UEEE which is made available to low-income earners in developing countries who would otherwise have no access to EEE, while at the same time preventing the import of e-waste that adds to the environmental burden of internally generated e-waste in Nigeria.

2.2 General Approach

The PiP was trained in the testing and pacaging of UEEE at Electronic Recyclers International (ERI) in the USA. To obtain a realistic picture of qualities, quantities, origin, and types of imported UEEE, the PiP participated in as many inspections of containers and vehicles carrying UEEE as possible during the project period at the Tin Can Island Port Complex (TCIPC) and the Lagos Port Complex Apapa in Lagos, which are the hubs of UEEE imports into Nigeria.

As it cannot be proven that the PiP could actually catch and inspect all UEEE imports during the project period, he additionally accessed official documents for all imports of containers via these two ports in 2015 and 2016, and scanned them for imports of UEEE. The data from inspections were then used to consolidate the data from the import documents in order to calculate the total annual volumes of UEEE imports, their composition, and origin, etc. The approach is described in detail in chapter 4 on page 17.

[3] Nigerian Ports Authority, information retrievable from http://www.nigerianports.org/defaultTin CanPort.aspx

[4] Nigerian Ports Authority, information retrievable from http://www.nigerianports.org/defaultLagosPort.aspx

3 PORTS OF LAGOS AND THE IMPORTATION PROCESS

3.1 The Lagos Port Complex Apapa and the Tin Can Island Port Complex

Nigeria has six sea ports in total:

- The Lagos Port Complex Apapa (LPCA) in Apapa, Lagos,
- The Tin Can Island Port Complex (TCIPC) in Lagos in Apapa, Lagos,
- Calabar Port in Calabar, Cross River State,
- Delta Port in Delta State,
- Rivers Port at Port Harcourt, Rivers State and
- Onne Port in Rivers state of Nigeria.

The two Lagos ports (LPCA and TCIPC) are equally relevant for UEEE imports, while the other ports of Nigeria focus more on crude oil export even though they also deal with other goods. For UEEE imports, they are of minor importance.

The LPCA and TCIPC are both located in the Apapa Local Government Area of Lagos State, where they serve as the economic door to the nation at large and to hotspots for the importation of UEEE into Nigeria, hence the reason for choosing the Lagos ports. Another port in Lagos, the RoRo Port, was merged in 2006 with the TCIPC. [5] Activities at the other Nigerian ports are more related to oil and gas exports.

The Lagos Port Complex Apapa [6] (LCPA) is located in the Apapa area of Lagos. It is Nigeria's largest port. The complex covers about 120 hectares of land. It has a firm, flat terrain, sand-filled and some concrete paved land area. The port has facilities for berthing dry bulk cargo: about 19 berths for general cargo handling, stacking areas, and storage facilities. The Tin Can Island Port Complex [7] (TCIPC) is located north west of the LPCA. It has four terminals and the PTML terminal for roll-on/roll-Off (RoRo) imports of vehicles. Appendix 3 gives more detailed insights into the terminals of the two ports.

The container handling terminals at the TCIPC and LPCA are the most relevant for the imports of UEEE, so the PiP focused his activities on these terminals. For the vehicles, the PiP concentrated his inspection activities on the Five Star and PTML terminal, where the non-containerized vehicles (roll-on/roll-off) were unloaded.

3.2 The Import Procedure and Related Documents

Several entities and persons are involved in the importation process:

- The importer and/or consignee and/or their agent
- The Nigeria Customs Services (NCS)
- The Nigerian Ports Authority (NPA)
- The terminal operators

The import procedure is as follows:

1) Once the importer has the invoice of the purchased goods to be imported into Nigeria, the importer fills out the electronic form (e-form) 'M' and submits it to the Authorized dealer bank along with other required documents.
2) The bank will thereafter validate and transmit the 'M' form and the accompanying documents to NCS.
3) Once the export from the country of origin is initiated, the shipping line issues the bill of lading (BoL) for the importer or consignee mentioned on the document.
4) The importer or the consignee submits the BoL to the NPA Central Office for Planning and Information (C.O.P.I) at the expected port of discharge.
5) The shipment company issues the shipping manifest (SM) and sends a copy to the NPA office at the point of discharge.
6) Once the shipment has arrived at the point of discharge, the importer or consignee (or their agent) completes the Bill of Entry and registers it with the NCS.
7) After the ship's arrival, the importer or the consignee has the shipping company release the imported goods.
8) The shipping line cross-checks and compares the BoL with the SM. After certifying the correctness of the consignee's documents, the shipping company issues the "Delivery Order" (D.O.) to the importer (consignee/agent), a document the Nigerian Ports Authority supplies to shipping companies.
9) The consignee or his agent fills out the D.O. and returns it to the shipping company together with the BoL. The shipping company scrutinizes the details on the D.O., endorses it, and withdraws the original BoL.
10) Thereafter, the shipping line detaches the lower portion of the D.O. and hands it back to the importer who keeps this as evidence that the shipping company releases his consignment.
11) The shipping line sends the main body of the D.O. to the Terminal Operator at the specific port of discharge.
12) The Terminal Operator raises all necessary bills through a computerized system, i.e. the Proforma Invoice, the Insurance Certificate, Regulatory Certificates/Permits (e.g. from NAFDAC, SONCAP Pharmaceutical Board of Nigeria, etc.), and any additional documents that might be prescribed by relevant government agencies.
13) All the documents listed above are attached to the raised bills and the importer presents it to the bank for payment.
14) On receipt of bank confirmation of payment by the importer/consignee, the terminal operator raises the Terminal Delivery Order.
15) Thereafter, NCS assigns the examination of the container to the NCS officer in charge.
16) The terminal operator places the container at a place in the terminal for inspection/examination. The importer or his/her agent invites the customs and other regulatory agencies for inspection to check the conformity of the documents provided (form M, BoL, pre-arrival form, etc.) with the actual imported goods to ensure the correctness of the duty and value-added tax the importer paid.
17) The importer and dock workers, under the employment of the different terminal operators' assigned personnel, open the container and offload the contents for the inspection by the competent NCS officers and other authorized officials. In some cases, all the goods are offloaded during inspection. At other times, the goods are only offloaded to a degree that allows the inspectors to at least see all the items remaining inside the container.
18) After inspection, the documents are transferred to the 'transit shed' or delivery point. The consignee or his agent then proceeds to the appropriate shed or delivery point to effect delivery after passing through these stages satisfactorily.
19) The container is thereafter loaded onto a truck, and a cargo pass is issued to the consignee or the agent, who then proceeds to the NPA gate for security checks and final exit from the port.

[5] Source: Tin Can Island Port, retrievable from http://www.nigerianports.org/AboutUsTinCanPort.aspx?id=3
[6] Nigeria Ports Authority, information retrieved from http://www.nigerianports.org/defaultLagosPort.aspx
[7] Source: Nigeria Ports Website, information retrievable fromhttp://www.nigerianports.org/defaultTinCanPort.aspx

Table 2 gives an overview of the various documents and their contents.

TABLE 2 // DOCUMENTS RELATED TO IMPORTS OF GOODS

Document	Core Information	Accessibility for PiP
Bill of lading (BoL)	• Port of loading, • Port of discharge, • Name, address and telephone of consignee and consignor, • Container and seal number, • Description of packages and goods as stated by shipper, • Gross weight and tare of the container, • Size of container and weight of contents, • Export reference and date of loading container in ship, • Final place of destination,	• Must be presented during inspection, container cannot be released without it being presented. • Mostly NCS granted access at inspection point
Shipping Manifest (SM)	• Like above, plus • Telephone of consignee and consignor, • Expected arrival date at the port of discharge, • Number of bill of lading,	• Available at NPA and at NCS (ASYCUDA) 2 – 7 days prior to arrival of ship • Largely access 1-3 days before the arrival of the ship in the traffic unit of NPA office at TCIP and LPCA • Full access to 2015 and 2016 SM in NPA offices of TCIPC and LPCA
Form M	• Description of goods, • Quantities and their measurements, • Free on board (FOB) unit price (total calculation in international currency of cost of goods, insurance and freight), • Total FOB cost • Total freight, • Total CFR, • Country of origin and country of supply; in some case the country of supply is different from the port it is exported from.	• Not accessible for the PiP
Packing list	• Like above, and • Form M number, • BA number (identification number for goods subject to Destination Inspection), • Country of supply, port of discharge, country of origin, country of supply	• In possession of importer or his/her agent at time of inspection • Full access at examination bay at the port at time of inspection
Final invoice	• Document shows price importer/owner paid for purchasing imported goods • Date issued, • Invoice Number, • Container and seal number, • Form M number, • BA number, • Description/quantity/unit price and amount in US dollar	• Importer or his/her agent makes document available to customs prior to inspection • Partial access at examination bay at the port
Customs declaration	• Contains the information from the pre-arrival assessment report (PAAR) i.e. Information relating to consignment • Stored in the Automated System for Customs Data (ASYCUDA)	• NCS granted limited access
Automated System for Customs Data (ASYCUDA)	**Enables the management of:** • Shipping manifests, • Import and export licenses, • Customs declarations, • Accounting functions and control files, • Valuation, examination, tariff and taxation, statistics, documentation **The system takes into account:** • International standards, • codes and recommendations adopted by the International Standards Organization (ISO), • The World Customs Organization: independent inter-governmental body whose mission is to enhance the effectiveness and efficiency of Customs administrations. It builds a partnership between customs administrations and their partners, by promoting an honest, transparent and predictable customs environment.	• Available at initiation of shipment • Limited access
Pre-arrival Assessment Report (PAAR)	• Digitalization of Import Documentation (customs declaration etc., based on UN-ADS) • Expert Tariff Classification Tool (HS Convention) • Assessment of Customs Value (WTO-ACV) • Import Export Commodity Database (IECD) • Detail Intelligent Risk Configuration encompassing (OGAs) • Issuance of Pre-Arrival Assessment Report (PAAR) • SMS Alert integration service • Confirmation of Transaction value by the Supplier • Flagging up of High Risk Commodities (WCO-GHRI) • Fast Tracking of Trusted Traders (AEO) • Third Party Pricing Data	• Agent submits all import documents around 14 days before arrival of cargo in port • Available at NCS • Limited access

3.3 Important Stakeholders

The PiP was supported by and worked in close cooperation with the Nigerian Ports Authority (NPA), the Nigerian Customs Service (NCS), and the Nigerian Environmental Standards and Regulation Enforcement Agency (NESREA).

3.3.1 The Nigerian Ports Authority

The Nigerian Ports Authority (NPA) is an agency of the Federal Government of Nigeria established by the Ports Act of 1954 with the responsibilities to manage, maintain, and operate the Nigerian sea ports and harbours.

The NPA controls activities at these ports, in affiliation with the Ministry of Transport and Nigerian Shippers Council, from its head office in Lagos. The Lagos Ports and Harbour Authority (LPHA) is the NPA division that controls the ports located in Lagos State and thus is of high relevance to the project. The relationship between the port authorities and the terminal operators are ruled by a "landlord and tenant relationship", where the NPA serves as the landlord while the tenants are the various terminal operators in the ports.

The responsibilities of NPA (the landlord) include:

- day-to-day technical and safety regulatory functions,
- primary rights to the basic and operational infrastructure within their respective jurisdictions,
- coordination of marine activities,
- general responsibility for overall port planning and development,
- issuing of licenses as authorized by and subject to guidelines set by the National Transport Commission,
- leasing and concessioning of port infrastructure,
- collection of port authority tariffs,
- investments in the quay wall, moorings, and dredging in cooperation with the operators,

The terminal operators in the Ports of Lagos

- are expected to invest in infrastructure like the quay apron (except the quay wall), stacking yard, equipment, security wall, lighting, etc.,
- carry out the cargo handling, stevedoring operations, and pilotage,
- are responsible for the security within the terminals, while the Nigerian Police controls the port gatesw

3.3.2 The Nigerian Customs Services and NESREA

There are presently four customs zones nationwide. The TCIPC the LPCA are under the jurisdiction of Zone A, which has its zonal command headquarters in Lagos. Each of the ports is controlled by one Area Controller assisted by Deputy Controllers, who are in charge of the terminals and their units in the command area. Each Deputy Controller is assisted by Assistant Controllers. NCS did not grant the PiP access to both ports at all time during the project period. However, overall the PiP was able to inspect containers and import documentation at both ports.

NESREA is a governmental enforcement agency. The project objectives – the assessment of UEEE including E-waste – touched core competences of NESREA. Therefore, obtaining NESREA's support was required, in that NESREA allowed the PiP to independently access the harbour without NESREA involvement. There were concerns that the direct involvement of NESREA might have otherwise hampered the purely scientific objective of the PiP project, since staff working in the harbour might have related the PiP's activities in the ports to enforcement and policing.

4 APPROACH FOR DATA ASSESSMENT AND EVALUATION

UEEE was found to be imported in containers with and without containerized vehicles and then stuffed into vehicles – passenger cars, buses, and trucks – that were imported via roll-on/roll-off (RoRo) vessels[8].

The basic approach for the data assessment was to inspect as many containers with UEEE as possible in the two relevant ports of Lagos, and to access and review as many months of import documentation from 2015 and 2016 as possible throughout the course of the project.

The data from the import documentation were used to assess the overall quantities and composition of UEEE imports. The inspection data were then applied to consolidate the data from the import documents.

4.1 Use of Data Sources

During the two project periods (PiP1 in 2015, PiP2 in 2016), the PiP had access to the following data sources:

- Inspection of containers with UEEE
  - From May to June 2015 at TCIPC, and additional three inspections at LPCA in the same period
  - From July to December 2016 at TCIPC
  - From August to December 2016 at LPCA
- Inspection of RoRo-imported vehicles at the PTML terminal of TCIPC for a total of 10 months
  - From March to June 2015
  - From June to December 2016
- Assessment of import documentation
  - Access and assessment of imports at TCIPC for January to April 2015, and for the entire year 2016 (16 months of imports)
  - Access and assessment of imports at LPCA for the entire year 2016 (12 months of imports)

During inspections, the PiP had partial access to the customs declaration and other documents in the PAAR in a few cases. For the review of import documentation, the PiP requested ASYCUDA (automated system for customs data) information from the NCS, but was provided with ASYCUDA printout information for only 25 containers out of 2,145 containers. Where available, the PiP then used the more detailed information from these documents to accurately assess the exact weight of UEEE that were in the containers that also carried non-UEEE. Full access to ASYCUDA would have allowed the PiP to search electronically for HS codes and terms indicating UEEE, and to retrieve the weight of the various goods in the containers.

Thus, the PiP had to rely mainly on the bills of lading during inspections and on the shipping manifests (SM), both for inspection and for the review of documented imports. The NPA in the LPCA and TCIPC had granted the PiP full access to several months of SM from 2015 and 2016, although only to the printed hard copies, so that the PiP had to scan the documents manually for key words related to UEEE. For some months throughout the project period, the PiP had access to the SM at the NPA three to five days prior to the arrival of the vessels. The PiP could thus identify incoming UEEE early, and prepare for the inspection accordingly. The SM lists the types of goods in the container and the total weight of the container content but not the individual weight of goods in the container. In cases where only UEEE was in the container, the total weight was therefore equal to the weight of UEEE, while the weight of the UEEE in the containers mixed with non-UEEE had to be estimated.

[8] In such vessels, the vehicles are not containerized but are driven on, transported, and driven off the ship.

Table 3 gives an overview of the time periods covered by the import documents and of the inspections.

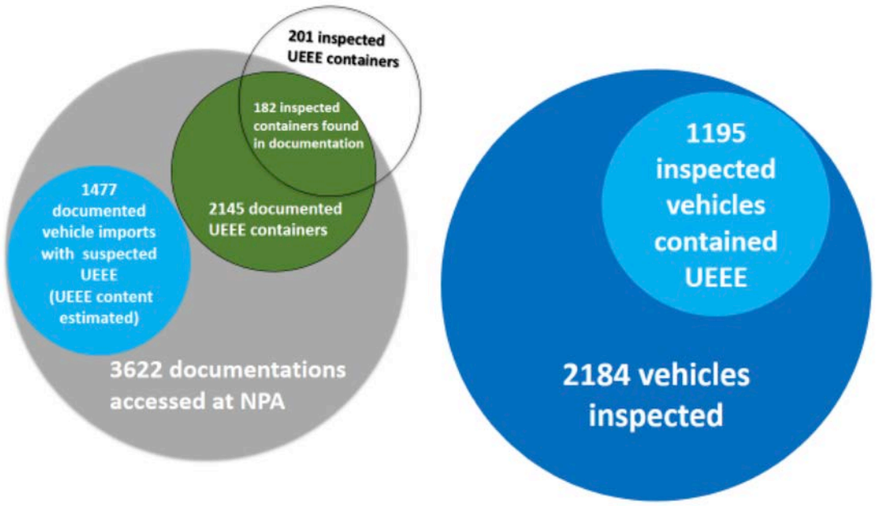
TABLE 3 // OVERVIEW ON DATA SOURCES AND ACCESSIBILITY

	2015												2016											
	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12
Documented imports TCIPC																								
Documented imports LPCA																								
Container inspections TCIPC																								
Container inspections LPCA																								
Inspection of RoRo vehicles																								

Legend: No access | Good access | Limited access RoRo: roll-on-roll-off

Figure 1 gives an overview on the activities and data sources described above.

FIGURE 1 // OVERVIEW OF INSPECTED AND DOCUMENTED UEEE IMPORTS



During the two phases of the project, the PiP

- inspected 201 imported containers carrying UEEE
  - 30 during PiP1 (27 at TCIPC, 3 at LPCA) from 23 March to 15 June 2015
  - 171 containers during PiP2 (154 at TCIPC, 17 at LPCA) from June 2016 through to end of December 2016

From these 201 inspected containers

- 99 were containers without vehicles carrying UEEE
  - 24 during PiP1 (21 at TCIPC, 3 at LPCA)
  - 75 during PiP2 (64 at TCIPC, 11 at LPCA
- 102 were containers with vehicles carrying UEEE
  - 6 during PiP1 (6 at TCIPC only)
  - 96 during PiP2 (90 at TCIPC, 6 at LPCA

- The PiP inspected 2,184 randomly selected non-containerized vehicles (RoRo) for UEEE imported via the Five Star Logistic Services and PTML terminals, both situated at TCIPC;
  - 480 during PiP 1 imported from March to June 2015;
  - 1,704 during PiP2 imported from June to end of December 2016;

- The PiP reviewed all SM covering the period from January to April 2015 and from January to end of December 2016, from which 3,622 containers were found to be relevant for UEEE imports.
  - 2,145 of the declared containers carried UEEE or suspected UEEE (SUEEE)
  - 1,411 containers without vehicles carrying UEEE or SUEEE
  - 734 containers carrying UEEE and containerized vehicles.
  - 1,477 importations of containerized vehicles without any declaration of other goods. Inspections had shown that 40% of these containers actually contain UEEE. Consequently, 40% of these 1,477 imports of vehicles in containers were considered to contain UEEE.

Of the 201 inspected containers with UEEE, 182 (around 91%) could be identified in the assessed NPA import documentation. For 19 containers (around 9%) the documentation was missing or could not be related to the inspected containers.

Figure 2 shows the inspection of containers with UEEE at the TCIPC.

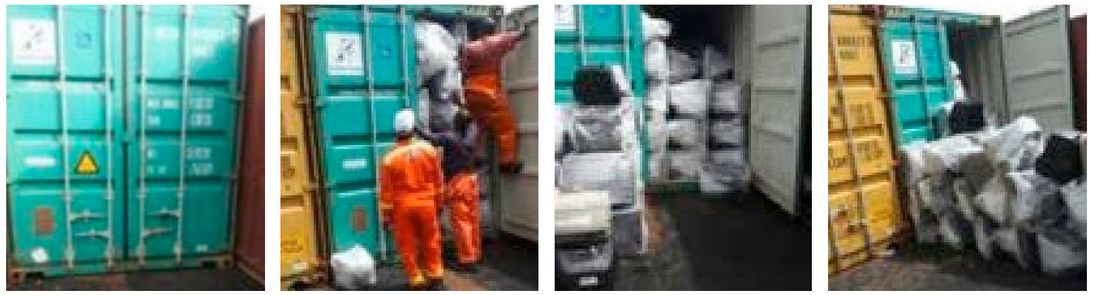
4.2 Inspection of Containers

The PiP and his assistants were present in the ports every day during the hours when inspections were carried out, and they participated in as many inspections of containers with UEEE as possible. Since not all containers were offloaded completely for the inspections, the PiP additionally tracked containers to the "Alaba Market" and assessed their contents when they were opened and unloaded there.

During the inspections, the PiP assessed the following information:

- Numbers, types, and weight of UEEE;
- Container number, so that the container could be identified in the NPA import documentation (shipping manifests);
- Country of origin: port of origin, and the consigner's country;
- Packaging (during inspections only);
- Availability of testing certificates and invoices (during inspections only);
- Consignor/consignor address;
- Consignee/importer's address;
- Port of export;
- Quality/condition of UEEE, i.e. appearance, completeness, packing style, etc.;

FIGURE 2 // INSPECTION OF CONTAINERS WITH UEEE AT TCIPC



In containers with vehicles, the vehicle itself and the container space around the vehicle is stuffed with UEEE, which often is not declared in the bill of lading and in the SM.

Since the PiP had only limited access to the customs declaration of the inspected containers, the PiP applied the following procedure to assess the weight of UEEE in containers:

1. counted or, in case of large numbers of UEEE and lack of time, estimated the numbers of the different types of UEEE in the container;
2. counted or estimated the amounts of non-UEEE in the containers;
3. calculated/estimated the total weight of the UEEE based on the number and average weight from literature for the individual types of UEEE;
4. calculated/estimated the weight of non-UEEE in the container including the brand and resulting weight of vehicles;
5. subtracted the weight of non-UEEE from the total weight of the container indicated in the bill of lading or in the SM.

The last step allowed for a plausibility check. If the sum of UEEE and non-UEEE (steps 3 and 4 above) did not deviate largely from the result of step 5, the amounts of UEEE calculated were considered to be sufficiently reliable. In cases where the PiP had access to the customs declaration, the PiP took into account this more detailed information, specifically the weight of the various goods, for his assessment.

4.3 Inspection of Non-Containerised Vehicles (RoRo-imported)

Imported vehicles are normally filled with various goods, including but not limited to UEEE (Figure 3), although they are mostly declared as 'vehicles only' in the customs declaration, as well as in the shipping manifests and in the bill of lading. The PiP therefore did not rely on the import documents, but inspected as many vehicles as possible to obtain realistic insights and figures into the actual inflow of UEEE via RoRo-imported vehicles.

FIGURE 3 // UEEE STUFFED IN VEHICLES IMPORTED VIA RORO AT THE TCIPC PTML TERMINAL

An accurate assessment of the number and weight of UEEE stuffed in vehicles was challenging considering that the number and weight of UEEE and other goods stuffed into the vehicles were not accounted for in the import documentation. In a few cases where this information was recorded, the declared quantities and weight were found to be unreliable.

The Five Star Logistic terminal and the PTML terminal, both part of the TCIPC, are the hubs of RoRo vehicle imports into Nigeria. Overall, the inspection of the non-containerized vehicles (RoRo) was carried out at three different points:

- At the Five Star Logistic terminal while the NCS inspected the vehicles;
- At the major exit of the TCIPC PTML through which all vehicles exit the port after examination by NCS; most drivers stop after they have passed the port exit to properly rearrange the cargo for transport. The PiP used this opportunity to assess the volumes and types of contents in the vehicles.
- At the parking space of the Five Star Logistic terminals of the TCIPC; the PiP could look into the cars through the windows and see whether it contained UEEE and, at least partially, what types of UEEE. In cases where the content of the vehicle was covered or hidden in the trunk and impossible to see, it was assumed that the car contained no UEEE.

To cope with situations with limited access to the cargo in the vehicles, the PiP developed the UEEE loading profiles in Table 4, based on the inspection of 50 vehicles. In cases where the PiP had only limited access and/or limited time for the assessment, but could at least identify some UEEE in the vehicle, the PiP applied the profile (see table 4 below) to estimate the UEEE content.

TABLE 4 // LOADING PROFILES OF VEHICLES

	Frequently Imported UEEE Types	Vehicle category	Estimated weight of UEEE stuffed in the vehicle and the category of UEEE
Type 1	Mainly big and small household appliances	Car	**216 kg** (composed of 2 refrigerators, 10 LCD TVs, 12 electric table cookers, 5 electric kettle, 5 pressing iron)
		Bus	**660 kg** (composed of 7 refrigerators, 5 LCD TVs, 5 CRT TVs, 20 electric table cookers, 25 electric kettles, 40 pressing iron,5 microwave oven)
		Truck	**1,540 kg** (composed of 30 refrigerators, 20 LCD TVs, 30 electric table cookers, 30 electric kettles, 60 pressing irons, 10 microwave oven)
Type 2	Mainly office equipment information and TVs	Car	**175 kg** (composed of 2 photocopiers, 5 printers, 5 LCD TVs)
		Bus	**568 kg** (composed of 8 photocopiers, 10 printers, 10 LCD TVs)
		Truck	**1,546 kg** (composed of 25 photocopiers, 20 printers, 30 LCD TVs)
Type3	Mainly mix of household appliances and information and communication technology (ICT)	Car	**222 kg** (composed of 1 photocopier, 1 refrigerator, 10 desktop computers, 5 microwaves, 5 LCD TVs)
		Bus	**531 kg** (composed of 8 photocopiers, 1 refrigerator, 10 desktop computers, 5 microwaves, 10 LCD TVs)
		Truck	**1,595 kg** (composed of 10 photocopiers, 20 refrigerators, 20 desktop computers, 20 microwave, 5 LCD TVs, 10 air-conditioner units)
Type 4	Mainly large household appliances	Car	**255 kg** (composed of 2 refrigerators, 1 washing machine, 10 LCD TVs, 5 units of electric table cooker, 30 pressing iron)
		Bus	**562 kg** (composed of 6 refrigerators, 2 washing machines, 10 LCD TVs, 3 air-conditioner units, 20 pressing iron)
		Truck	**2,647 kg** (composed of 40 refrigerators, 10 washing machines, 20 LCD TVs, 10 CRT TVs, 5 electric table cookers, 5 air-conditioner units)
Type 5	Mainly office equipment	Car	**283 kg** (composed of 1 photocopier, 10 LCD monitor, 10 desktop computers, 5 printers, 20 laptops)
		Bus	**528 kg** (composed of 5 photocopiers, 10 LCD monitors, 10 desktop computers, 5 printers, 20 laptops)
		Truck	**1,181 kg** (composed of 20 photocopiers, 10 LCD monitors, 30 desktop computers, 10 printers, 20 laptops)
Type 6	Mainly large household appliances and office equipment	Car	**321 kg** (composed of 1 refrigerator, 2 photocopiers, 5 desktop computers, 5 LCD monitors, 5 printers, 10 DVD players)
		Bus	**380 kg** (composed of 5 refrigerators, 2 photocopiers, 5 desktop computers, 5 LCD monitors, 8 DVD players)
		Truck	**1,165 kg** (composed of 20 refrigerators, 20 desktop computers, 20 LCD monitors, 2 washing machines, 10 printers, 20 DVD players)
Type 7	Mainly small and large household appliances and office equipment	Car	**100 kg** (composed of 1 refrigerator, 1 microwave, 1 printer, 8 LCD monitors, 10 pressing iron)
		Bus	**305 kg** (composed of 3 refrigerators, 8 microwaves, 10 LCD monitors, 5 printers)
		Truck	**1,261 kg** (composed of 20 refrigerators, 15 microwave ovens, 30 LCD monitors, 30 DVD players, 5 electric table cooker)

To develop these profiles, the PiP carried out inspections at another parking space that serves both the Five Star and the PTML terminal. Importers use this place to transfer the cargo from the newly imported vehicles into another vehicle which is already registered in Nigeria before leaving the port premise. The importers thus try to avoid interceptions by NCS, especially when the imported goods are contraband or otherwise illegally imported items, such as refrigerators. The NCS has a special unit to control vehicles on the roads throughout the country and check for illegally imported goods. As the imported vehicles are not yet registered in Nigeria, they are easy to identify and thus are prone to checks.

The total volume of UEEE in RoRo-imported vehicles was calculated as follows:

1. Calculation of the average weight of UEEE stuffed in the vehicles carrying UEEE
2. Calculation of the percentage of all inspected vehicles stuffed with UEEE
3. Multiplication of the average total number of annual RoRo vehicle imports for 2015 and 2016 with the percentage of vehicles with UEEE (result of step 2) to obtain the average number of vehicles imports carrying UEEE per annum
4. Multiplication of the average number of vehicles imports carrying UEEE per annum with the average weight of UEEE stuffed in the vehicles carrying UEEE

The total number of RoRo-imported vehicles was available at NPA. The numbers do, however, not detail the types of vehicles. Therefore, for the calculation of annual UEEE imports via RoRo-imported vehicles, the PiP assumed that the share of various vehicle types imported via RoRo into Nigeria is equivalent to their share in the number of inspected vehicles. As this assumption produces uncertainties, in particular due to the potential effect that trucks/buses are more frequently inspected because they are known to hold more UEEE, this uncertainty was taken into account in a sensitivity analysis in section 5.2.4 on page 31.

4.4 Assessment of UEEE Imports in Containers from Shipping Manifests

4.4.1 Identification and Assessment of UEEE in Import Documents

The SM from NPA were searched manually for terms directly containing UEEE, such as UEEE, used washing machine, used dish washer, used TV, etc. Additionally, the documents were scanned for the terms “personal effects” and “household goods” that may not necessarily be UEEE, but were found during inspections to often indicate UEEE. These terms are herein referred to as terms indicating suspected UEEE (TISU).

Other potential TISU like office equipment, used hospital equipment, cookers, musical equipment, and sewing and knitting machines were found to be all UEEE during inspections and were therefore counted as 100% UEEE. A list of HS codes was obtained from NCS. The HS codes found in the shipping manifests of the declaration of goods could thus additionally be used to identify actual or suspected UEEE (SUEEE).

When UEEE or SUEEE could be identified, the following information was extracted from the shipping manifests:

- Date of arrival of shipment;
- Description of imported goods (type of UEEE);
- Quantity and type of UEEE imports;
- Consignor/consignor address;
- Consignee/consignee address; and
- Port of export

4.4.2 Assessment of UEEE Imports in Containers from SM and Consolidation with Inspection Data

For the calculation of the volumes of UEEE imported, five cases had to be differentiated:

1. For documented imports of 'Containers with UEEE only' (i.e. excluding vehicles and other non-UEEE in containers), the total weight of the goods in the container indicated in the SM could be used. During inspection, the PiP only found actual UEEE in the containers where UEEE was declared as the only content.
The total volume of UEEE imports per year in containers with UEEE were only calculated from the months of available data, based on the average number/weight of containers imported per month.

2. For 'Containers with UEEE and non-UEEE other than vehicles', the weight of the UEEE cannot be assessed from the SM since only the total weight of goods in the container is indicated. In these cases, the average weight of the UEEE in all inspected 'Containers with UEEE and non-UEEE other than vehicles' was used. To calculate the annual volumes of UEEE imports in such containers, the number of such imports was calculated per year, based on the available months covered by import documentation. The number of annual imports was then multiplied by the average weight of UEEE in these containers that was calculated from the inspection data.

3. 'Containers with UEEE and vehicles' were treated separately since the vehicles presented a considerable weight share in the containers, and the inspection had shown that considerable volumes of UEEE in these containerized vehicles were not or incorrectly declared. For the containerized vehicles, the average weight of UEEE could not be reliably assessed from the documents. The average weight of UEEE in all inspected 'Containers with vehicles' was therefore used to calculate the annual volumes of UEEE imports in such containers by multiplying the average weight with the number of such containers identified in the SM.

4. For 'Containers with goods declared as TISU only', the data from inspection were used to calculate the UEEE imports. During the inspections of the 201 containers, the PiP calculated the percentage of cases for each of the TISU where he actually found UEEE in the containers. These inspection data were used to quantify the suspected UEEE (SUEEE) in those containers which only contained goods declared as TISU. To give a simple and fictive example: The PiP found UEEE in 70% of cases where the content was declared as "household goods". In the next step, the PiP scanned all those SM for which no field data was available for the term "household goods".
The declared weight of household goods in all these documents was totalled. Assuming these were 10,000 t, it was further assumed that 70% of this weight was actually UEEE (7,000 t). The same exercise was done with all SM with goods declared with TISU.

5. For 'Containers with UEEE and goods declared in TISU', it was assumed that the goods behind the TISU are 100% UEEE, in cases where the inspection had shown more than 50% of actual UEEE behind the respective TISU. In these cases, the volume of UEEE in the container was calculated as described for 'Containers with UEEE only' in point 1. In all other cases, the UEEE content in the container was calculated as described for 'Containers with UEEE, vehicles and other non-UEEE" in point 2 above.

4.4.3 Compensation of Missing SM with Inspection and ASYCUDA Data

While reviewing the available SM for 2015 and 2016, the PiP found import documentation in some months that were actually from other months and in parts from 2014, up to half a year earlier. It is therefore suspected that SM covering the documentation assessment periods in 2015 and 2016 could have slipped into piles of SM intended to cover other time periods that were not assessed.

Of the 201 containers inspected by the PiP during the project periods, 19 (9.5%) could not be allocated to SM because the respective SM was not available. Similarly, from 25 ASYCUDA data sets received from the NCS for the relevant time period, two (8%) of the containers in the data set could not be identified in the SM. Although based on small samples, this reinforces the suspicion that the SM for the relevant assessment period were not quite complete.

The results for the calculations of imported UEEE volumes and number of imports based on SM were therefore corrected assuming that 9.5% of SM were missing.

4.5 Assessment of Types and Conditions of Imported UEEE

The types of imported UEEE and their share in the imports of UEEE could only be assessed from data and observations obtained during the inspection of the 201 containers. Generally, UEEE is not properly declared in the shipping manifests. Also, the weight of the individual types of UEEE, if indicated, is not declared in the shipping manifests either. The PiP therefore recorded the types of UEEE and the number of UEEE in the containers, and calculated their weight and quantities to arrive at the shares of individual types of UEEE in the total imports of UEEE.

To assess the conditions of these imported UEEE, the PiP used the following approach:

- Assess the outer appearance of the UEEE (cleanliness, packaging);
- Check the availability of testing certificates;
- Check the unloaded UEEE for the availability of the cables;
- Test as many devices with cables as possible unless the outer appearance already indicated that the device is nonfunctional;
- Register the overall result for each container.

Whether the device could be switched on and off was tested. Beyond that, the tests were restricted to those functionalities that can be controlled directly after switching on the devices, to determine whether:

- the compressor in refrigerators starts;
- toasters heat up;
- TVs operate, etc.

All functions that require a longer testing period could not be included in a large percentage of the functionality test exercise, due to time constraints. Only the few UEEE that were bought at the market were fully tested. For the vast majority, they remained unchecked to determine whether:

- the compressors in refrigerators actually enable cooling and switch off once the target temperature is achieved;
- the toaster switches off after the intended time of operation;
- the TV can show and switch between all programs available at the testing site and whether other functions are working properly, etc.

Due to time constraints during inspections and missing electricity (unavailability of electric power points) at the terminals, the PiP could not carry out functionality tests at the terminals. Using a generator to generate electricity for testing was not advisable, as the noise of such a device would have attracted too much attention, which might have hampered the PiP's work and acceptance on site. Using a portable battery was technically impossible as there was no device available at an acceptable price that was lightweight and had sufficient capacity.

The PiP therefore followed 28 containers with imported UEEE to the Alaba Market, the largest market for UEEE in Lagos, and tested the functionality of UEEE there. The PiP purchased some UEEE at the point of offloading at Alaba Market and carried out testing later, or followed importers/distributors to their sale/retail outlet shop and tested the devices there.

A more systematic and detailed functionality testing approach was not possible due to time constraints, unavailability of power source at the examination bay, and limited accessibility to the UEEE. The results of the above functionality tests should therefore be considered as best case results.

5 EVALUATION OF DATA FROM INSPECTION AND IMPORT DOCUMENTS

5.1 Average Contents of UEEE in Inspected Containers

Table 5 shows the volumes of UEEE in the 201 containers inspected in the LPCA and the TCIPC during the entire project period.

TABLE 5 // VOLUMES OF UEEE IN INSPECTED CONTAINERS WITH AND WITHOUT VEHICLES

Ports	Inspection of containers with UEEE without vehicles			Inspection of containers with UEEE and vehicles		
	No.	Total UEEE (t)	Average (t)	No.	Total UEEE (t)	Average (t)
LPCA	14	131	9.40	6	55	9.20
TCIPC	85	833	9.80	96	889	9.30
Total:	**99**	**964**	**9.74**	**102**	**944**	**9.25**

The containers without vehicles on average carried around 490 kg (5%) more UEEE than those with containerized vehicles. This difference may appear small since vehicles consume considerable space in the containers.

However, UEEE is stuffed inside and around the vehicles to make use of the available space as much as possible.

The estimated UEEE volumes in the containers inspected at LPCA seem to be lower than those at the TCIPC. This effect is probably not significant since only a small number of containers (20) could be inspected at LPCA compared to 181 at TCIPC.

5.2 Volumes of UEEE Imported into Nigeria via TCIPC and LPCA

5.2.1 Imports of UEEE in RoRo-vehicles

The inspection of RoRo-imported vehicles showed that, in most cases, UEEE in these vehicles was not declared in the import documents. The import volumes of UEEE with these vehicles were therefore estimated during the inspection. From the 2,184 inspected vehicles – cars, buses, and trucks - 1,195 were found to contain UEEE. On average, 54.7% of the inspected vehicles contained 630 kg of UEEE as illustrated in Table 6.

TABLE 6 // RESULTS OF INSPECTION OF RORO-IMPORTED VEHICLES

Inspection of RoRo Vehicles					
	No.	With UEEE	Vehicles with UEEE (%)	Total UEEE (t)	Average (kg, rounded)
Cars	1,020	497	48.7%	111	220
Buses	756	421	55.7%	212	500
Trucks	408	277	67.9%	433	1,560
Total	**2,184**	**1,195**	**54.7%**	**756**	**630**

Typical contents of imported vehicles, depending on the vehicle type, could be:

- For cars, a mix of large UEEE and small UEEE, such as two photocopiers, two refrigerators or 2 washing machines, and 2 LCD TV sets or 5 CRT.
- For a bus, 6 to 9 refrigerators, 2 to 4 washing machines, 20 LCD TVs, and other smaller items such as electric kettles, electric pressing irons, electric cookers, DVDs.
- For a truck, 32 to 50 refrigerators, 30 to 50 LCDs, and other non -UEEE goods, such as vehicle spare parts, mattresses, cloths, bicycles, and small furniture.

Appendix 1 shows examples of typical UEEE contents of vehicles.

FIGURE 4 // RORO-IMPORTED VEHICLES STUFFED WITH GOODS

Table 7 shows the volume of UEEE imported in RoRo-vehicles. The total number of RoRo-imported vehicles was calculated from NPA import data as the average of the years 2015 and 2016.

As no breakdown for the share of the vehicle types in the total imports was available, their share in the total imports was assumed to be the same as their respective percentages in the inspected 2,184 vehicles, which are:

- 46.7% cars
- 34.6% buses
- 18.7% trucks

The uncertainties linked to this assumption are addressed in section 5.2.4 on page 31.

TABLE 7 // ANNUAL IMPORTS OF UEEE IN RORO-VEHICLES INTO NIGERIA

Vehicle Types	Share of Vehicles in RoRo-imported Vehicles	No. of Vehicle Imports per Year*	Vehicles with UEEE	No. of Vehicles with UEEE	Average UEEE Content (kg)	Annual UEEE Imports (t, rounded)
Cars	46.7%	56,330.01	49%	27,447	220	6,000
Buses	34.6%	41,750.48	56%	23,250	500	11,600
Trucks	18.7%	22,532.01	68%	15,297	1,560	23,900
Total	**100%**	**120,613**		**65,994**		**41,500**

*Source: NPA

In 2015 and 2016, around 41,500 t of UEEE were imported in RoRo-vehicles. The import of UEEE in trucks is the largest portion (around 58%), followed by buses (around 28%) and vehicles (around 14%).

5.2.2 Imports of UEEE in Containers

Table 8 shows the volumes of UEEE imports in containers without vehicles during the assessment period. Around 1,060 t of declared UEEE were imported annually in containers without vehicles in 2015 and 2016 respectively, 63% of it via the TCIPC.

TABLE 8 // DOCUMENTED IMPORTS OF DECLARED UEEE IN CONTAINERS WITHOUT VEHICLES

Ports	Assessment Period (Months)	Containers with UEEE During Assessment Period	Average UEEE Contents (t)	Total UEEE in These containers (t)	Containers per Year	Annual UEEE Imports (t)
LPCA	12	44	8.9	390	44	390
TCIPC	16	100	8.9	890	75	670
Total:		**144**		**1,280**	**119**	**1,060**

The inspection of containers showed that a high portion of the goods that are declared as household goods (HG) and personal effects (PE) are actually UEEE. Such terms that indicate suspected UEEE (TISU) were found in the declaration of 1,267 imported containers. Table 9 illustrates the details.

TABLE 9 // IMPORTS OF UEEE DECLARED IN TISU IN DOCUMENTED CONTAINERS WITHOUT VEHICLES

Ports	Assesment Period	TISU	No. of containers	Total Weight of SUEEE (t)	Percentages of TISU Found to be UEEE (Inspection)	Annual UEEE Imports (t, rounded)
LPCA	12	Household goods	130	1,160	70%	810
		Personal effects	93	830	80%	660
		HG + PE	164	1,460	75%	1,100
Subtotal LPCA			**387**	**3,450**		**2,570**
TCIPC	16	Household goods	295	2,630	70%	1,380
		Personal effects	212	1,890	80%	1,130
		HG + PE	373	3,330	75%	1,880
Subtotal TCIPC			**880**	**7,850**		**4,380**
			1,267	**11,300**		**6,950**

Around 6,950 t of UEEE in 1,267 containers without vehicles are imported annually and declared as HG or PE. This declaration mode thus represents the largest import volumes of UEEE in containers.

Table 10 shows the documented imports of UEEE in containers with vehicles and UEEE. The average weight of UEEE in these containers could not be assessed from the SM. Therefore, the PiP calculated the difference (in percentage) between the average weight of UEEE in containers with vehicles and in containers without vehicles found during inspection in the two ports (see Table 5 on page 26). In average, containers with vehicles imported via the LPCA were found to carry around 2% less UEEE than containers without vehicles, and around 5% less for imports via the TCIPC. The average weight of UEEE in the documented containers (8.9 t, see above Table 8) was reduced for the respective percentages, which results in an average of 8.71 t and 8.45 t of UEEE in containers with vehicles.

TABLE 10 // IMPORT OF UEEE IN CONTAINERS WITH VEHICLES

Ports	Assessment Period (Months)	Containers with UEEE During Assessment Period	Averages (t)	Total UEEE (t)	Containers per Year	Annual UEEE Imports (t, rounded)
LPCA	12	77	8.71	670	77	670
TCIPC	16	657	8.45	5,550	493	4,160
Total:		**734**		**6,220**	**570**	**4,830**

Around 4,830 t of UEEE were imported annually in 570 containers with vehicles, most of it around 86%, via the TCIPC. In particular for containers with vehicles, inspections showed that they contain UEEE and other goods although just the vehicles were declared. Table 11 shows the UEEE volumes resulting from these imports.

TABLE 11 // IMPORTS OF UEEE IN DOCUMENTED CONTAINERS WITH VEHICLES DECLARED ONLY

Ports	No. of containers with declared vehicles only	Average UEEE in containers with vehicles (inspection, t)	Share of containers with UEEE (t, inspection)	Total UEEE (t, rounded)	Containers per year	Annual UEEE Imports (t, rounded)
LPCA	155	8.71	40%	540	155	540
TCIPC	1,322	8.45	40%	4,470	992	3,350
Total	**1,477**			**5,010**	**1,147**	**3,890**

Around 3,890 t of UEEE were imported annually undeclared in containers with vehicles.

5.2.3 Total Annual Imports of UEEE

Table 12 totals the annual UEEE imports from the various import modes via the LPCA and TCIPC in Lagos.

TABLE 12 // SUMMARY OF ANNUAL UEEE IMPORTS VIA LPCA AND TCIPC

Import mode	UEEE Imports in Containers							
	Without vehicles			With vehicles				
Ports	Without vehicles	Without vehicles, declared in TISU	Import documents missing, without vehicles	With vehicles	With declared vehicles only	Import documents missing, with vehicles	With RoRo-vehicles	Total (rounded)
LPCA (t)	390	2,570	280	670	540	110		4,560
TCIPC (t)	670	4,380	480	4,160	3,350	710	41,500	55,250
Total (t)	**1,060**	**6,950**	**760**	**4,830**	**3,890**	**820**	**41,500**	**59,800**
Total in Containers (t, rounded)		**8,800**			**9,500**			
			18,300					

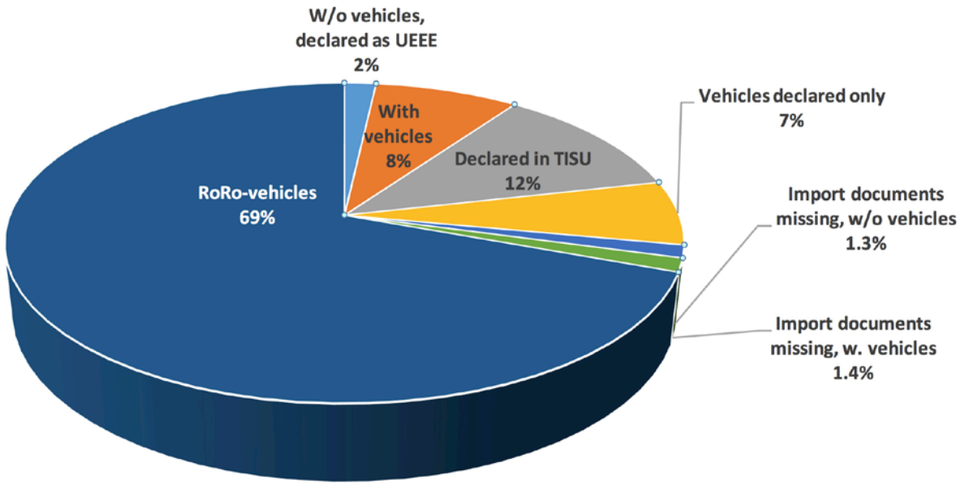
The PiP had inspected 201 containers with UEEE. For 19 of these containers, about 9.5%, the SM were missing in the import documentation. All imports of UEEE with containers were therefore increased for 9.5% to compensate for the missing documentations of UEEE imports, which results in an additional 760 t of UEEE in containers without vehicles and 820 t in containers with vehicles, or 1,580 t in total.

Around 8,800 t of UEEE were imported in containers without vehicles, and declared as UEEE (1,060 t), TISU (6,950 t), and in containers without import documents (760 t). Another 9,500 t of UEEE entered Nigeria in containers with vehicles: 4,830 t in containers with vehicles and declared UEEE (or with UEEE declared in TISU), another 3,890 t in containers for which only vehicles were declared, and 820 t in containers with missing import documents. The UEEE imports in containers amounts to a total of 18,300 t.

With around 41,500 t per year, the UEEE import in RoRo-vehicles is the most significant importation route of UEEE. Most of the UEEE imported in these vehicles was found to be undeclared. Overall, around 59,800 t of UEEE were imported annually in 2015 and 2016 via the above import channels.

Figure 5 illustrates the shares of the above importation modes in the total UEEE imports.

FIGURE 5 // ROUTES OF UEEE IMPORTATION VIA LPCA AND TCIPC



Around 69% of the UEEE are imported with RoRo-vehicles. UEEE imports in containers account for around 31% of the total assessed UEEE imports. Around 16% of UEEE comes with containerized vehicles: around 8% in containers with vehicles and declared UEEE, another 7% with declared vehicles only. The compensation of missing documents adds 1.4% to the total UEEE imports in containers with vehicles.

The UEEE imports in containers without vehicles account for around 15% of the total imports. For around 12% of these imports, the UEEE is declared in terms indicating suspected UEEE (TISU), i.e. household goods, personal effects or both. The imports in containers with declared UEEE represent only 2% of the total imports. The compensation of missing documents adds 1.3% to the total UEEE imports.

5.2.4 Data Uncertainties for UEEE Imports in Containers and RoRo-Vehicles

Data Uncertainties for UEEE Imports in RoRo-Vehicles

While the data situation suggests that RoRo-imported vehicles are the largest UEEE import stream, the data of the actual magnitude of these imports are significantly more uncertain.

The UEEE content in these vehicles – cars, buses and trucks is highly dependent on the vehicle type. The total number of annual RoRo-imports was 120,613 vehicles per year, on average for 2015 and 2016. A breakdown to vehicle types was, however, not available.

It was therefore assumed that the percentage share of each of the three inspected vehicle types in the total number of RoRo-imported vehicles is equivalent to their percentage share in the number of inspected vehicles:

Cars	46.7%
Buses	34.6%
Trucks	18.7%

To test the sensitivity of the UEEE import volumes to changes in the composition of vehicle types, it was assumed that the above share of buses and trucks changes for ± 1%, ± 5% and ± 10%, respectively, at the expense of the number of cars. Table 13 shows the differences of UEEE volumes compared to the 41,500 t of assessed imports and the resulting total UEEE imports for each of the scenarios.

TABLE 13 // SENSITIVITY OF RORO-IMPORTED UEEE VOLUMES TO CHANGES IN THE COMPOSITION OF VEHICLE TYPES

Change of shares of vehicle types	± 1%	± 5%	± 10%
Increase of UEEE imports (t)	+ 1,360	+ 6,800	+ 13,600
Total RoRo-imported UEEE (t)	42,860	48,300	55,100
Decrease of UEEE imports (t)	- 1,360	- 6,800	- 13,600
Total RoRo-imported UEEE (t, rounded)	40,140	34,700	27,900

A change of ± 1% of buses and trucks – decreasing the share of cars by 2% - already changes the RoRo-imported UEEE volumes for ± 1,360 t, resulting in total RoRo-imports of 42,900 t and 40,200 t, respectively. A 10% deviation already results in ± 13,600 t of RoRo-imported UEEE, or a total of 27,900 t and 55,100 t of RoRo-UEEE, respectively, instead of 41,500 t.

The volumes of UEEE imported with RoRo-vehicles are thus sensitive to changes in the shares of vehicle types in the total number of RoRo-imported vehicles. There is, however, no information or clues that would help to define actual upper or lower limits for the UEEE imports in RoRo-vehicles that are more than arbitrary. The share of each vehicle type in the total number of inspected RoRo-imported vehicles is the only empirical data available. It is therefore not possible to calculate a reliable range of UEEE imports via RoRo-vehicles.

Regardless, the import of UEEE in RoRo-vehicles is, however, a relevant import route. A worst case scenario that assumes that all RoRo-imported vehicles are cars would decrease the import of UEEE with RoRo-imported vehicles to 12,900 t, instead of 41,500 t. The UEEE in RoRo-vehicles would then account for 41% of all incoming UEEE (based on 18,300 t of imported UEEE in containers), and around 30% assuming that the imports in containers are 29,600 t, which was estimated as a scenario taking into account a higher share of missing import documents in the next section. As buses and trucks were observed to carry UEEE as well, the related UEEE influx is certainly larger than 12,900 t and the share of RoRo-imported vehicles under all circumstances is a relevant, if not the dominating, import channel.

Data Uncertainties for UEEE Imports in Containers

Underdeclaration of the Weight of Imported Goods

It can be assumed that the contents of imported goods are typically under-declared to save costs for taxes and other fees. The average weight of UEEE in the 99 inspected containers without vehicles was estimated to be 9,740 kg, compared to the 8,900 kg of average of UEEE content estimated from import documentation[9], which mathematically means around 9% higher UEEE contents in the inspected containers. This deviation, however, does not allow for the quantification of the underdeclaration effect. The PiP had no possibility to weigh the contents of containers or of individual goods in the containers during the inspections, and therefore had to use the total weight of the containers indicated in the SM for his estimates of UEEE contents, c.f. chapter 4.4 on page 23. Furthermore, the estimates of the numbers and types of UEEE during inspections may be a source of uncertainty as well, since, on the one hand, the PiP had limited time during the inspections, and, on the other hand, containers could contain a large variety of UEEE and non-UEEE so that errors could easily occur. In these cases, the PiP had to estimate the types and numbers of UEEE and non-UEE in these containers during inspection, along with their average weights, to calculate the weight of UEEE in the containers. Thus, the underdeclaration effect cannot be quantified.

Missing Shipping Manifests for 2015 and 2016

The calculation of overall UEEE imports in containers highly depends on the completeness of the shipping manifests received from NPA for the assessment period. Actually, the SM for particular months were mixed with SM from previous months, sometimes from six months earlier. The fact that 19 of the 201 inspected containers – around 9.5% - could not be found in the SM supports the suspicion that the reviewed import documents for 2015 and 2016 were incomplete. The UEEE imports in containers was therefore increased for 9.5%, but this may not fully reflect the actual situation.

To obtain more insight, the PiP interviewed several workers, clearing agents, and customs officers working at the terminals in the LPCA and TCIPC about the number of incoming containers with UEEE. On average, they estimated around 98 container imports with UEEE per week, which would result in around 5,110 containers with UEEE per year. The PiP had identified 2,882 containers with UEEE per year. Taking into account the above 9.5% of missing import documents increases the number of containers to 3,155 containers with UEEE per year. The 5,110 containers carrying UEEE estimated by the port staff would therefore be around 62% more than 3,155.

Accordingly, increasing the UEEE imports in containers results in 29,600 t of annual UEEE imports in containers. The total UEEE imports per year raises from 59,800 t to around 71,100 t. The total imports of UEEE in containers without vehicles grow from 8,800 t to 14,200 t per year, and the imports in containers with vehicles from 9,500 t to 15,400 t per year.

Impact of Data Insecurities on the Overall Result

Overall, the above considerations show that even a considerable 62% increase of the container imports has only a limited influence on the overall result. A change of 1% in the number of containers only results in around ± 183 t. The same applies for the effects of potential underdeclaration. The UEEE import in containers is much less sensitive to data uncertainties compared to the situation with RoRo-imported UEEE, where a change of 1% in the shares of buses and trucks in the total number of RoRo-imported vehicles already influences the result by ± 1,360 t. There is no substantiated data that would allow assessing a reliable range for the container and RoRo imports of UEEE. Due to potential effects of underdeclaration and of missing import documents, it may, however, be assumed that the assessed volumes of imported UEEE in containers present a minimum and may in reality be higher.

Taking into account the overall data uncertainty situation, the figures for total UEEE imports are rounded to a full one thousand tonnes, resulting in total imports of 60,000 t per year for 2015 and 2016, respectively.

[9] The data situation did not allow for reliably calculating an average content of UEEE in containers with vehicles.

5.2.5 Share of Imported UEEE in Total Imports via the LPCA and TCIPC

Underdeclaration of the Weight of Imported Goods

Table 14 shows the number of laden containers and the related volumes of imports at the LPCA and the TCIPC. The data were derived from Table 30 on page 94 in Appendix 4, in combination with still unpublished and thus confidential data from NPA indicating the number of containers imported and broken down to the various ports of Nigeria. As some of the data are preliminary and some were found to be inconsistent, the below information should be considered as an approximation only.

TABLE 14 // NUMBER OF LADEN CONTAINERS AND IMPORTS VIA LPCA AND TCIPC

	Containers (Units)	Imports (t)
2,015	505,418	7,946,579
2,016	426,429	7,726,771
Averages	**465,923**	**7,836,675**

The 3,155 containers imported per year found to carry UEEE in the assessment represent 0.7% of all container imports. Thus, 1 out of 143 imported containers contains UEEE. The 18,300 t of UEEE imports in these containers are equivalent to about 0.2% of goods imported in containers via the LPCA and TCIPC in 2015 and 2016.

The imported 5,110 containers with UEEE annually estimated by the ports staff would result in a share of around 1.1% of containers, and 29,600 t of UEEE imported in these containers would represent about 0.38% of goods imported in containers via the LPCA and TCIPC in 2015 and 2016. Thus, the uncertainty concerning the actual number of imports in containers has no crucial influence on the share of containers with UEEE and the weight of UEEE in the total imports via the two ports.

5.3 Composition of UEEE Imported in Containers

Table 15 shows the various types of UEEE found in the 201 containers that the PiP inspected during the project period.

TABLE 15 // TYPES OF UEEE IN INSPECTED CONTAINERS

Type of UEEE	LCD TV	Printer	Air Cond.	Fridge	Washing Machine	Desktop Comp.	Laptop	Comp. LCD Monitor
No. of Imports	99	31	44	81	59	53	24	7
No. of UEEE	72596	13,923	178	6237	1692	12,222	15,800	348
Weight [t]	341	90.5	116	218	110	121	55.3	4.9

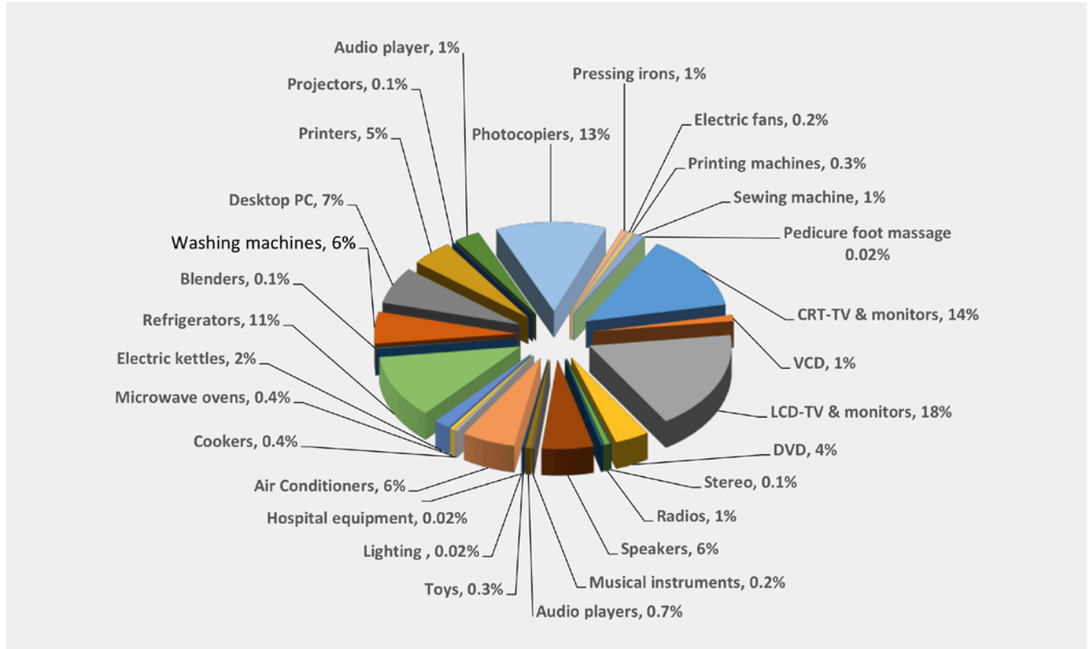
Type of UEEE	CRT TV	Radio Set	Musical Equipment	Audio Players	Keyboards	VCD	Microwaves	Pressing Irons
No. of Imports	103	9	3	7	5	14	7	14
No. of UEEE	8100	6250	-	-	6,370	4,260	545	13,800
Weight [t]	256	12.5	3.9	12.5	6.37	21.3	8.18	13.8

Mob. Phone	Speaker	Kettle	Cooker	Photo-copier	DVD Player	Stereo Set		
2	32	14	9	37	33	2		
51,200	2825	34,600	152	4534	14,980	181		
5.12	113	34.6	6.98	240	74.9	1.27		

Fan	Knitting/Sew-ing Machine	Toys	Blenders	Printing machine	Lighting equipm.	Hospital equipm.	Projecting machine	Pedicure foot massager
5	4	1	1	1	1	1	1	1
2026	1521	-	--	-	-	-	-	-
4.54	21.3	4.8	2.44	5.32	0.34	0.32	1.8	0.40

Figure 6 illustrates the shares of weight of the various UEEE types in the inspected containers based on Table 15 above. Since the declarations of UEEE types were not sufficiently specific to allow a breakdown into types of UEEE, these data from inspection could only be used to assess the composition of the UEEE imports. It is assumed that it reflects the composition of UEEE imports in containers in 2015 and 2016. The composition of UEEE imported in RoRo-vehicles could not be assessed due to accessibility and time constraints, but might be at least similar to the composition in in containers.

FIGURE 6 // WEIGHT SHARES OF DIFFERENT UEEE IN THE 201 INSPECTED CONTAINERS WITH AND WITHOUT VEHICLES (ROUNDED)



LCD-TVs and monitors account for around 18% of the UEEE imports, followed by CRT-TVs and monitors with around 14%. TVs and monitors thus have a share of slightly more than 30% in the total UEEE imports.

Photocopiers (13%), desktop computers (7%), speakers (6%), printers (5%), DVD players (4%), laptops (3%), VCDs (1%), radios (0.7%), mobile phones (0.3%) and stereo equipment (0.1%), musical instruments (0.2%), and audio players (0.7%) together account for slightly more than 40% of all imported UEEE. Information and communication technology (ICT) and consumer electronic (CE) devices stand for around 70% of the UEEE imports.

Large and small household goods like refrigerators (11%), washing machines (6%), electrical cookers (0.4%), as well as microwave ovens, blenders, pressing irons, electric fans, and electric kettles (together around 4%), in total represent roughly 21% of the imports. Air conditioners contribute 6% to the total UEEE influx. The other types of UEEE in the above figure together are only 3% of the imported UEEE.

It is noteworthy that NESREA's National Environmental (Electrical/Electronic Sector) regulation from 2011 prohibits the import of CRT-devices, which nevertheless represent 14% (256 t) of UEEE in the inspected containers.

5.4 Origin of UEEE Imports

5.4.1 Main Exporting Countries

The term "origin of UEEE imports" can have two meanings:

- the country of residence of the consignor
- the country in which the port of export is located.

According to the SM received from NPA, only about 8% of all containers with UEEE were exported from ports that were in countries different from the consignors' countries of residence. The PiP observed that most consignors use the address of the shipping companies handling their consignment. The reason is probably that most importers were Nigerians resident in Nigeria who may not have real residential addresses in the countries of export and therefore use the shippers' addresses as their contact address in the countries of export.

Given the fact that most importers are Nigerians and the consignors' addresses are not reliable, the PiP only assessed the country in which the port of export is located as the "country of origin".

Table 16 shows the countries, from whose ports the amounts of annual UEEE imports into Nigeria were exported.

TABLE 16 // MAIN COUNTRIES IN WHICH THE PORTS OF EXPORTS OF 2015/2016 UEEE IMPORTS INTO NIGERIA ARE LOCATED

Location of Port of Export	RoRo-vehicles (t)	Containers w/o vehicles (t)	Containers w. vehicles (t)	Total annual exports to Nigeria (t)	Share in annual imports into Nigeria	Ranking
Germany	11,670	300	50	12,020	20.03%	1
UK	10,130	720	860	11,710	19.52%	2
Belgium	5,240	260	160	5,660	9.43%	3
Netherlands	4,860	70		4,930	8.22%	4
Spain	2,170	450	1,790	4,410	7.35%	5
China		3,870	530	4,400	7.33%	6
USA	800	550	3,080	4,400	7.33%	6
Ireland	3,660	30		3,690	6.15%	7
Italy	460	210	290	960	1.60%	8
Poland	900			900	1.50%	9
Finland	870			870	1.45%	10
Malaysia		380	370	750	1.25%	11
UAE		380	350	730	1.22%	12
Morocco		270	450	720	1.20%	13
Singapore		250	340	590	0.98%	14
Hong Kong		440	100	540	0.90%	15
Denmark	340		70	410	0.68%	16
France	350	40		390	0.65%	17
Canada		40	200	240	0.40%	18
Japan		90	100	190	0.32%	19
Australia			100	100	0.17%	20
Korea			100	100	0.17%	20
South Africa		60		60	0.10%	21
India		50		50	0.08%	22
Greece		40		40	0.07%	23
Turkey			40	40	0.07%	23
Other Countries		310	500	810	1.35%	
Overall total	**41,500**	**8,800**	**9,500**	**59,800**	**100%**	
EU total	**40,700**	**2,100**	**3,200**	**46,000**	**77%**	

Most imported UEEE originated from ports in Germany (around 20%) followed by the UK (around 19.5%), and Belgium (around 9.4%) due to their high share of UEEE exports with RoRo-vehicles, which is the largest UEEE import stream into Nigeria. The Netherlands (8.2%) and Spain (7.35%) followed by China and the USA (7.33% each) are next in the ranking of main exporters, followed by Ireland (6.2%). Overall, these eight countries account for around 85% of UEEE imports into Nigeria. EU member states were the origin of around 77% of UEEE imported into Nigeria. Germany (28%), UK (24%), Belgium (13%), The Netherlands (12%), Ireland (9%), and Spain (5%) are the main exporters of UEEE in RoRo-vehicles. The EU member states account for 98% of these UEEE imports the rest coming from the USA.

China leads the export of UEEE in containers. Around 24% of these UEEE imports originated in China, followed by the USA (20%), Spain (12%) and the UK (9%). Around 29% of UEEE imports in containers were exported from ports located in EU member states.

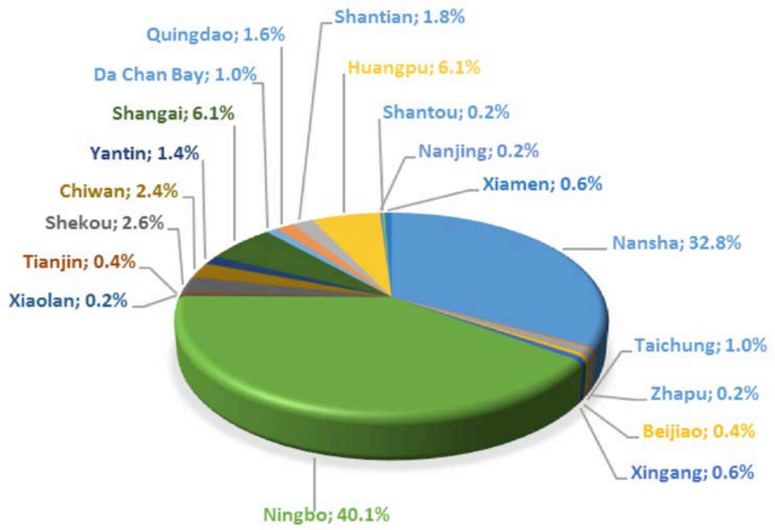
As for UEEE imports in containers without vehicles, China is the largest exporter (44% of these imports), followed by the UK (8%), USA (6%), Spain (5.1%), and Hong Kong (5%). The EU member states were the origin of around 24% of these imports into Nigeria.

The USA (32%) leads the exports of UEEE in containers with vehicles followed by Spain (19%), the UK (9%), China (6%) and Morocco (5%). The EU member states account for around 34% of the UEEE imports in containers with vehicles.

5.4.2 Main Ports of UEEE Exports in Containers

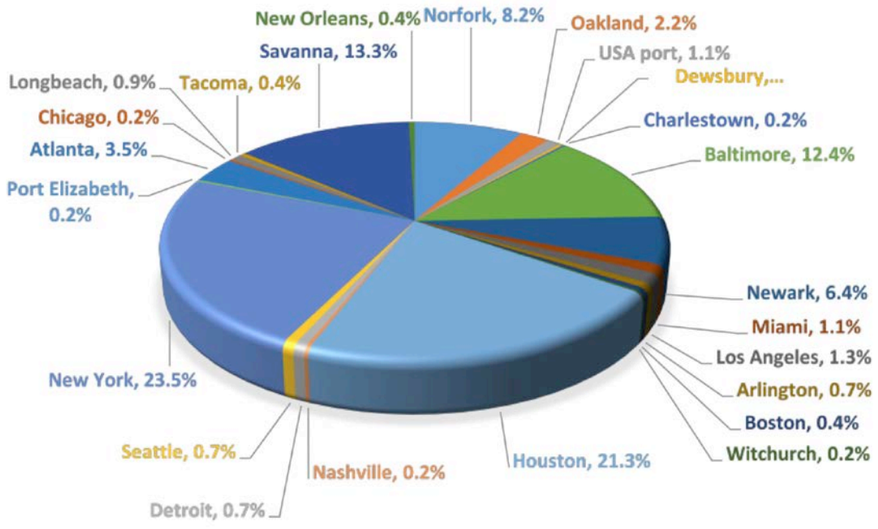
The approach of how the UEEE contents in RoRo-imported vehicles were assessed (see chapter 4.3 on page 20) did, in many cases, not allow for the access to the importation documents. The ports of UEEE imports into Nigeria could therefore only be assessed for the imports in containers. Figure 7 shows the ports of UEEE exports in China based on the number of exports.

FIGURE 7 // PORTS OF UEEE EXPORTS IN CONTAINERS IN CHINA BASED ON NUMBER OF EXPORTS



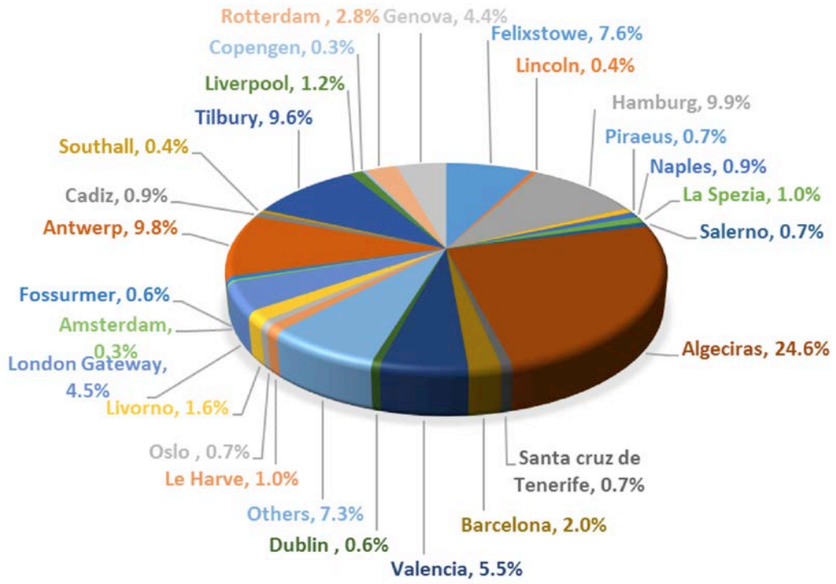
Around 73% of containers with UEEE from China were shipped from Ningbo (40%) and Nansha (33%). Figure 8 presents the main ports in the USA.

FIGURE 8 // PORTS OF EXPORT OF UEEE IMPORTED IN CONTAINERS FROM THE USA BASED NUMBER OF EXPORTS



The ports of New York (24%), Houston (21%), Savannah, and Baltimore (13% each) accounted for about 70% of all numbers of UEEE exports in containers from the United States. Figure 9 illustrates the situation for exports originating from the EU and Norway.

FIGURE 9 // PORTS OF EXPORT OF UEEE IN CONTAINERS FROM THE EU BASED ON NUMBER OF EXPORTS

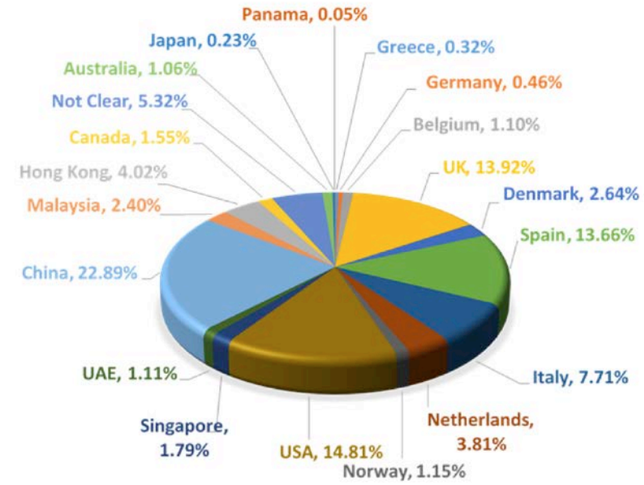


The main ports of export from Europe are Algeciras in Spain (25%), followed by Hamburg in Germany, Antwerp in Belgium, and Tilbury in the UK with around 10% each. Around 8% of exports originated from Felixstowe (UK), 6% from Valencia (Spain), 5% from London Gateway, 4% from Genova (Italy) and 3% from Rotterdam. These ports account for around 80% of all exports from the EU and Norway.

5.4.3 Countries of Origin of CRT Devices

The origin of CRT-devices is of particular interest because Nigeria has banned their import. Figure 10 presents the countries from whose territories the imported CRT-TVs originated.

FIGURE 10 // COUNTRIES OF ORIGIN OF CRT SHIPMENTS IN INSPECTED CONTAINERS (BASED ON WEIGHT)



The main sources of CRT-TVs were China (22.9%), USA (14.8%), UK (13.9%), Spain (13.7%), Italy (7.7%), Hong Kong (4.0%) and the Netherlands (3.8%). These six countries accounted for about 81% of the total CRT imports of about 256 tonnes.

Countries in the EU accounted for around 45% of CRT-TV imports i.e. 115 tonnes. As "origin" refers to the country in which the port of export is located, the CRT-TVs can actually originate from other countries, which could, however, not be assessed, as the required information was not available in the necessary detail.

5.4.4 Data Uncertainties Related to the Ranking of Main Exporting Countries

UEEE imports with RoRo-vehicles dominate the total UEEE imports. As explained in section 5.2.4 on page 31, the actual volumes highly depend on the share of the various vehicle types – cars, buses, trucks. In the absence of data on the share of each vehicle type in the total number of imported vehicles, it was assumed that the share of the various vehicles is identical to the share of these vehicle types in the percentage of inspected vehicles. As almost all RoRo-imported vehicles were exported from ports located in the EU, changes in the numbers of RoRo vehicle imports may in particular affect the position of the EU in the total exporter ranking. Table 17 displays the share of the exporting countries in the UEEE imports into Nigeria for the assessed UEEE imports via RoRo-vehicles (total of 41,500 t per year), compared to the assumed worst case scenario that all RoRo-imported vehicles carrying UEEE are vehicles resulting in 12,900 t of annual UEEEE imports via this route only.

TABLE 17 // MAIN COUNTRIES IN WHICH THE PORTS OF EXPORT OF UEEE IMPORTED INTO NIGERIA ARE LOCATED, ASSUMING THAT ALL RORO-IMPORTED VEHICLES ARE CARS

Location of Port of Export	RoRo-vehicles (t)	Containers w/o vehicles (t)	Containers w. vehicles (t)	Total annual exports to Nigeria (t)	Share in annual imports into Nigeria (%)	Ranking	Ranking in assessment
UK	3,150	720	860	**4,730**	**15.26%**	1	2
China		3,870	530	**4,400**	**14.19%**	2	6
Germany	3,630	300	50	**3,980**	**12.84%**	3	1
USA	250	550	3,080	**3,900**	**12.58%**	4	6
Spain	670	450	1,790	**2,910**	**9.39%**	5	5
Belgium	1,630	260	160	**2,050**	**6.61%**	6	3
Netherlands	1,510	70		**1,580**	**5.10%**	7	4
Ireland	1,140	30		**1,170**	**3.77%**	8	7
Malaysia		380	370	**750**	**2.42%**	9	12
UAE		380	350	**730**	**2.35%**	10	13
Morocco		270	450	**720**	**2.32%**	11	14
Italy	140	210	290	**640**	**2.06%**	12	9
Singapore		250	340	**590**	**1.90%**	13	15
Hong Kong		440	100	**540**	**1.74%**	14	16
Poland	280			**280**	**0.90%**	15	10
Finland	270			**270**	**0.87%**	16	11
Canada		40	200	**240**	**0.77%**	17	19
Japan		90	100	**190**	**0.61%**	18	20
Denmark	110		70	**180**	**0.58%**	19	17
France	110	40		**150**	**0.48%**	20	18
Australia			100	**100**	**0.32%**	21	21
Korea			100	**100**	**0.32%**	21	21
South Africa		60		**60**	**0.19%**	22	22
India		50		**50**	**0.16%**	23	23
Greece		40		**40**	**0.13%**	24	24
Turkey			40	**40**	**0.13%**	25	25
Other Countries		310	460	**770**	**2.48%**		
Overall total	**12,900**	**8,800**	**9,400**	**31,000**	**100%**		
EU total	**12,600**	**2,100**	**3,200**	**18,000**	**58%**		

Table 17 above shows that in the worst case scenario, the UK becomes the leading UEEE exporter (from rank 2 to 1). The share of China in the total UEEE imports would double approximately (from rank 6 to 2), Germany (from rank 1 to 3), and the USA (from rank 6 to 4). Spain remains the no. 5 exporter, followed by Belgium (from rank 3 to 6), the Netherlands (from rank 4 to 7) and Ireland (from rank 7 to 8).

Although some countries change their positions, the eight main exporters of UEEE to Nigeria remain the same and account for around 80% of all UEEE exports to Nigeria instead of 86%. The EU still would be the origin of around 58% of UEEE imports instead of 77%, and would thus continue to be the major exporter of UEEE imported into Nigeria. Each of the other countries exporting UEEE to Nigeria contributes less than 3% to the total UEEE imports. Additionally, taking into account that the assumed scenario is highly unlikely to happen since buses and trucks were actually observed to carry UEEE in 2015 and 2016, the assessment of the main exporting countries is hardly sensitive to uncertainties regarding the actual volumes of UEEE imported with RoRo-transported vehicles.

The same applies if the UEEE imports via containers are assumed to be 63% higher than calculated, based on the estimates of port workers and officials (c.f. page 32), and the UEEE imports via RoRo-vehicles remain at the assessed level of 41,500 t. Table 18 shows the main exporting countries in this scenario.

TABLE 18 // MAIN COUNTRIES IN WHICH THE PORTS OF EXPORT OF UEEE IMPORTED INTO NIGERIA ARE LOCATED, ASSUMING THAT UEEE IMPORTS IN CONTAINERS ARE 63% HIGHER THAN ASSESSED

Location of Port of Export	RoRo-vehicles (t)	Containers w/o vehicles (t)	Containers w. vehicles (t)	Total annual exports to Nigeria (t)	Share in annual imports into Nigeria (%)	Ranking	Ranking in assessment
UK	10,130	1,160	1,390	**12,680**	**17.86%**	1	2
Germany	11,670	480	80	**12,230**	**17.23%**	2	1
China		6,250	860	**7,100**	**10.00%**	3	6
USA	800	880	4,990	**6,700**	**9.44%**	4	6
Belgium	5,240	410	260	**5,910**	**8.32%**	5	3
Spain	2,170	720	2,900	**5,790**	**8.15%**	6	5
Netherlands	4,860	110		**4,970**	**7.00%**	7	4
Ireland	3,660	40		**3,700**	**5.21%**	8	7

Despite some changes in the ranking - in particular China (from rank 6 to 3) and the USA (from 6 to 4) become more important - the main exporting countries remain the same. The eight countries in the above list account for 83% of all UEEE imports. All other countries contribute less than 2% each to the UEEE imports. The EU member states are the origin of 69% of all UEEE imports in this scenario, compared to 77% for the assessed volumes of UEEE imports in containers.

China (24%), the USA (20%), Spain (12%), and the UK (9%) are the main exporters of UEEE in containers, with China (44%) leading the UEEE exports in containers without vehicles, followed by the UK (8%), USA (6%), and Spain (5%). The USA (32%), Spain (19%), the UK (9%), and China (6%) are the main exporters of UEEE in containers with vehicles. The shares of the various exporters in the container import modes in this scenario are the same as the assessed volumes of UEEE imports.

Overall, despite some changes, the ranking of the countries from whose ports the exports of UEEE to Nigeria originate is not sensitive to changes of the export volumes in RoRo-vehicles and containers. In all scenarios, at least 58% of the total imports of UEEE into Nigeria originate from ports located in the EU. The leading role of the EU member states in UEEE exports to Nigeria is stable in all scenarios.

5.5 Declaration of Imported UEEE

The documentation requirements of the container shipment include that the exporter should indicate and register the content, composition, and quantity of the items in the container at the port of export.

The field work at TCIPC and LPCA revealed that importers of UEEE do not always follow international best practices, especially in:

- packaging of UEEE;
- testing and confirmation of functionality;
- description/labelling of goods; and
- declaration of UEEE and use of HS

Codes for effective tracking of flows of goods. Shipping documents showed that HS codes were not commonly used by importers of UEEE. Container numbers were used for identification of shipments. Overall, the use of numbers that could be linked to HS codes in the shipping documentation is about only 7.3% in the assessed shipping manifests. Virtually all the observed numbers were not the same number of digits as the international HS codes used, and only one of such numbers could match any of the HS codes used for electronics. Declarations were found to be wrong, vague, or incomplete. For instance, the record might indicate only vehicles and used sewing machines without indicating other UEEE content, while the container actually contains other types of UEEE as well. Containers with goods imported into Nigeria could be declared as a car and 'personal effects' on the shipping manifest, however physical examination revealed it contains a vehicle, 25 CRT TVs, 40 electric cookers, and 5 radio sets.

Importers also register the content of their containers as used electronics without indicating the type of used equipment. This could be done to not raise suspicion, which could attract a regulatory agency. The comparison of import declarations and inspection results show that almost 70% of imports in containers are not properly declared, in particular in containers with vehicles.

FIGURE 12 // COMPARISON OF IMPORT DECLARATIONS IN SHIPPING MANIFESTS WITH PHYSICAL INSPECTION

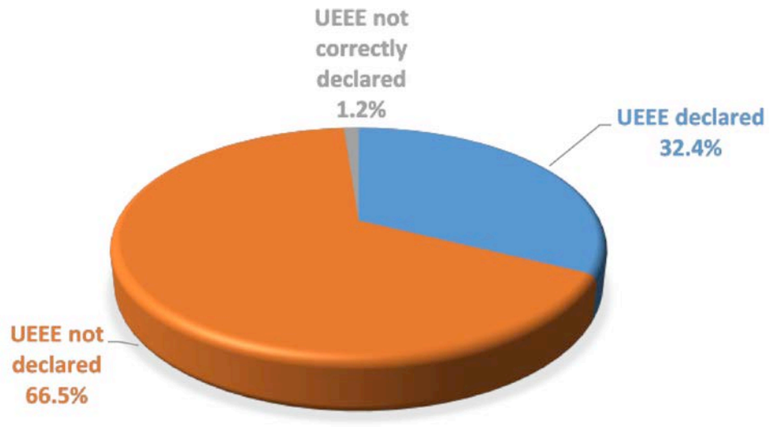
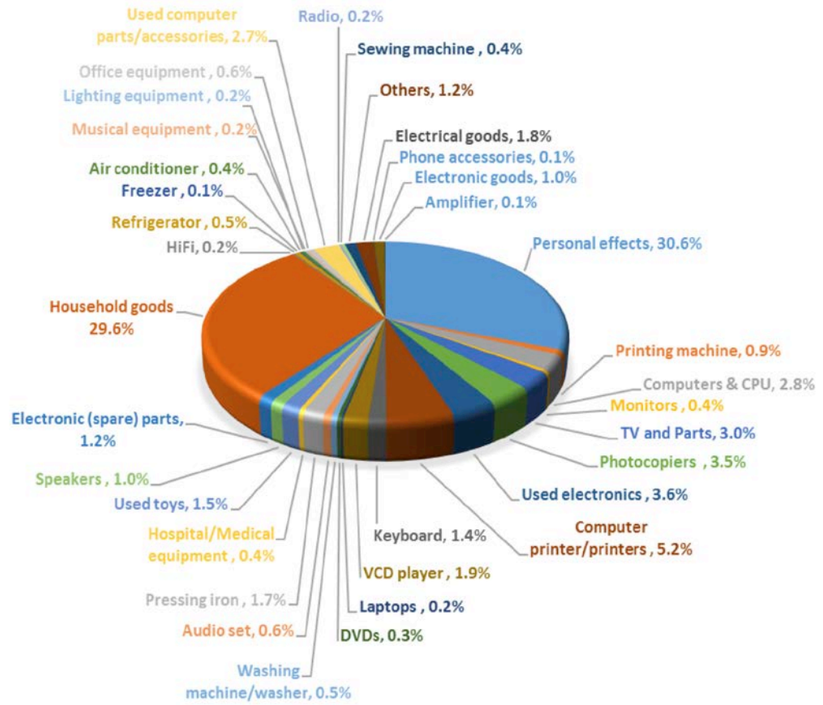


Figure 12 illustrates the declaration of imports found in the 2,145 shipping manifests of imports in containers with declarations of either UEEE or SUEEE, i.e. household goods (HHG) and personal effects (PE). Some imports declared as HHG, PE, or spare parts were described as 'not for sale' and 'donated items'. Some imports had addresses of embassies which may be indicative of relocation of embassy personnel. It was observed that, in most cases, imports from Hong Kong had the detailed contents of the containers described in the import documentation.

FIGURE 12 // DECLARATION OF UEEE IMPORTS BASED ON NUMBER OF IMPORTS



Some importers of UEEE describe their consignments as 'electronics and spare parts' or 'electronic goods and spare parts'. Some importers were more specific in the description of their goods; e.g. 'printing machine and spare parts', 'TV sets and spare parts', and 'printer and spare parts'. Inspections showed that sometimes, the spare parts were actually vehicle spare parts, though often mixed with UEEE.

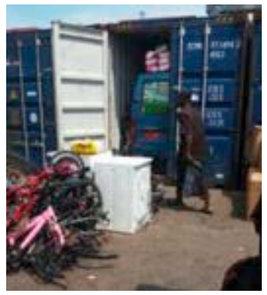
Importers of UEEE imported in containers prefer to label their goods as either 'Personal Effects' (31%) or 'Household Goods' (30%). Overall, UEEE was only properly described as UEEE or by category or type in slightly less than 40% of the assessed cases. The fact that most UEEE was mixed with other goods in the container may explain the observation that many of the shipping declarations were presented as 'used electronic equipment', 'personal effects', or 'household goods' without mentioning the product categories.

Figure 13 (below) shows a container loaded with bicycles, washing machine, and refrigerator, and a vehicle stuffed with goods of various nature including diapers. The middle and right picture show the discharged mixed content of other shipments.

FIGURE 13 // IMPORTATION OF UEEE MIXED WITH OTHER TYPES OF GOODS

The below figures show comparisons of actual contents in containers and the declarations in the shipping manifests.

FIGURE 14 // COMPARISON OF ACTUAL CONTENT OF A CONTAINER IMPORTED FROM THE UK WITH THE DECLARATION IN THE SHIPPING MANIFEST



Information from shipping manifest			
Container No	**Port of Loading/ Port of Discharge**	**Description**	**Container weight/size**
--- (deleted for confidentiality reasons)	London Gateway to TCIPC	Used Nissan Pickup, Used Honda Accord, Toyota Avensis, and lot of used Personal Effects	15,000kg, 40ft

FIGURE 15 // COMPARISON OF ACTUAL CONTENT OF A CONTAINER IMPORTED FROM THE UAE WITH THE DECLARATION IN THE SHIPPING MANIFEST

Information from shipping manifest			
Container No	**Port of Loading/ Port of Discharge**	**Description**	**Container weight/size**
--- (deleted for confidentiality reasons)	Jebel Ali to LPCA	Used Honda Accord	16,500kg, 40ft

Considering the reasons for improper declarations, importers may be afraid that the proper declaration of UEEE could attract the attention of regulatory agencies (NESREA) and therefore may prefer to label such goods as 'household goods' or 'personal effects'. The PiP realized during the inspections that importers in particular are careful to avoid labelling imports of banned CRT-TVs as such, but instead use terms like 'TV', 'monitor', or 'desktop' to not attract the attention of NESREA or NCS. The only declaration of 'CRT' in NPA documentation was for the importation of 1,258 CRT televisions from Morocco.

Importers of UEEE may also be labelling their goods in this way to avoid paying the right levies/taxes. For instance, an importer may choose to declare a container stuffed with a variety of goods ranging from cooking/ kitchenware to bicycles and electronics as personal effects, and claim that they were goods for personal use and not for sale.

5.6 Condition of Imported UEEE

5.6.1 Certificates of Testing and Functionality

During the inspections of 201 containers, the PiP found only two cases of containers with a certificate of functionality: one for an entire container load and another for just one/few devices in a container (Figure 16).

FIGURE 16 // FUNCTIONALITY CERTIFICATES FOUND ON IMPORTED UEEE FOR A SINGLE DEVICE (LEFT) AND THE CONTENTS OF A CONTAINER (RIGHT)

Nigerian regulation requires the importer to have a "Cargo Movement Requirement (CMR) document" available, including a functionality testing certificate. The competent enforcement officers (NESREA) are, however, not present in the port, and the customs officials focus on the collection of import duties and enforcement of conformance of declared and actual contents of containers.

Around 44% of the inspected containers were exported from ports located in the EU. According to the EU Directive 2012/19/EU (WEEE Directive), exporters of UEEE must have available on request "evidence of evaluation or testing in the form of a copy of the records (certificate of testing, proof of functionality) on every item within the consignment and a protocol containing all record information […]" and "[…] a declaration made by the holder who arranges the transport of the EEE that none of the material or equipment within the consignment is waste […]".

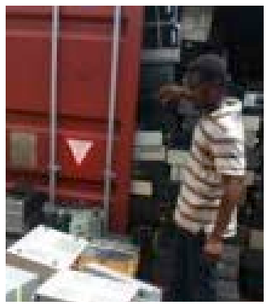
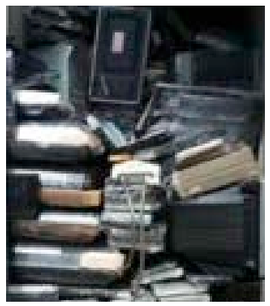
The WEEE Directive requires exporters to have these certificates available by request and not as an obligatory part of the export documents, and the certificates do not have to accompany the shipment. It can be assumed that the customs in the EU do not have the capacity to actually control significant amounts of containers for export. In Nigeria, the certificates are required as well, but the regulation is not enforced. Taking both the import and export side together, it would not be plausible to assume that the UEEE imported into Nigeria has actually undergone a reliable functionality testing.

5.6.2 Packaging and Outer Appearance of Imported UEEE

Figure 17 presents examples of UEEE packaging. Some devices were well-packaged while others were either very poorly packaged or treated as though they had little or no value, which may warrant classifying such goods as waste.

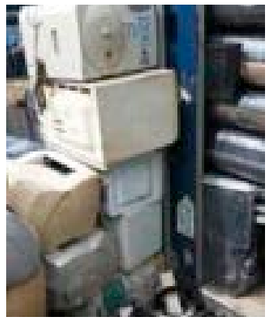
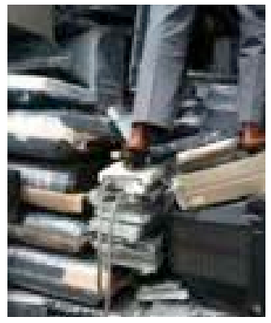
FIGURE 17 // MODES OF PACKAGING UEEE



The inspections of 201 containers revealed that only around 40% of the imported UEEE were properly packaged, while around 60% were either not packaged at all or not properly packaged.

FIGURE 18 // IMPORTED IMPROPERLY PACKAGED AND DIRTY UEEE


Around 75% of the containers contained only clean UEEE. Around 22% of the containers contained only dirty UEEE. The rest of containers carried a mix of clean and dirty devices. About 79% of the inspected containers contained only devices without outer damages, while the rest contained UEEE with varying degrees of their contents damaged, from around 1% to even between 75% to 100% of the containers.

In around 63% of the inspected containers, all UEEE had cables attached. In 15% of the containers, the cables of all UEEE in the containers were cut. The other 22% of containers carried varying numbers of devices with and without cables attached. In total, around 70% of all imported devices had the cables attached. During his fieldwork, the PiP learned that one reason importers cut the cables attached to UEEE is to make further economic gain by selling cables separately.

5.6.3 Functionality of Imported UEEE

Figure 19 shows the number and types of UEEE tested and the test results.
Devices without cables were excluded from testing. A total of 760 devices were tested.

FIGURE 19 // BASIC FUNCTIONALITY TESTING

UEEE Type	Tested	Nonfunctional	Nonfunctional (%)
Speakers	150	0	0%
Pressing Irons	80	4	5%
Photocopiers	200	10	5%
Microwaves	20	2	10%
Radios	30	4	14%
Cookers	20	3	15%
Refrigerators	30	10	33%
DVDs	40	15	38%
Air Conditions	10	4	40%
Mobile Phones	100	50	50%
LCD-TVs	80	44	55%
Total	**760**	**146**	**19%**

The tests show that in 6 of the above 11 product groups, the share of nonfunctional devices is low ranging between 0% and 15%. In the other five groups, the share of nonfunctional UEEE ranges between 33% (refrigerators) and 55% (LCD-TVs). On average, around 19% of the tested devices were non-functional.

The functionality test result must, however, be interpreted while taking into account the limitations of the approach as described in section 4.5 on page 25. They represent the best case scenario assuming that, besides the tested functionalities, the other functions of the devices are also working. Devices without cables were not tested. Considering them as 100% nonfunctional – which is not necessarily the case - would reduce the positive test results for the 30% of the imported UEEE, which had no cable attached. The actual share of nonfunctional devices is therefore probably higher than in the table above. On the other hand, it can be assumed that part of the nonfunctional equipment can and will be repaired in Nigeria. Actual repair rates of various types of UEEE in Nigeria could not be assessed, but assuming that all nonfunctional UEEE is dumped directly after the import would be misleading.

While the composition of UEEE imports could be assessed for the inspected containers (c.f. Figure 6 on page 34), the circumstances of the inspections did not allow this for UEEE imported with RoRo-vehicles.

Table 19 shows the volumes of the various nonfunctional types of UEEE, including the assumption that the composition and functional status of UEEE imports in RoRo-vehicles is the same as with the containers.

TABLE 19 // MINIMUM VOLUMES OF NONFUNCTIONAL DEVICES IN IMPORTED UEEE (BEST CASE, ROUNDED)

Type of UEEE	Share of UEEE Type in Imports	Nonfunctionality rate	Nonfunctional UEEE in containers (t)	Nonfunctional UEEE in containers and RoRo-vehicles (t)
LCD-TV	18%	55%	1,800	5,900
Photocopiers	13%	5%	120	380
Refrigerators	11%	33%	690	2,300
Air conditioners	6.1%	40%	440	1,500
Speakers	5.9%	0%	0	0
DVDs	3.9%	38%	270	880
Pressing Irons	0.72%	5%	7	22
Radios	0.66%	14%	17	55
Microwaves	0.43%	10%	8	26
Cookers	0.37%	15%	10	33
Mobile Phones	0.27%	50%	25	80
Total	60%		3,400	11,100
Other UEEE	40%	19%	1,400	4,600
Overall Total (t)	**100%**		**4,800**	**15,700**

Table 19 shows that Nigeria imports at least 4,800 t of nonfunctional UEEE annually in containers, assuming that the average 19% nonfunctionality rate applies to the non-tested devices. Assuming further that the UEEE composition and functionality rates in RoRo-imported vehicles are the same as in containers, the total imports of nonfunctional UEEE would increase to at least 15,700 t every year.

When broken down to types of UEEE, every year Nigeria imports at least 690 t of defect refrigerators in containers, or 2,300 t, assuming that the degree of nonfunctionality is the same for the imports in RoRo-vehicles as for those in containers. Air conditioners amount to 440 t (1,500 t). Both refrigerators and air conditioners may contain (H)CFCs. At least part of the 1,800 t (5,900 t) of LCD-TVs imported per year contains mercury in cold cathode fluorescent lamp (CCFL) backlights, the rest having LED backlights. Thus, UEEE containing hazardous substances are among the products with the highest nonfunctionality rates and the highest import volumes. In total, at least 2,900 t (9,700 t) of these nonfunctional devices potentially containing hazardous substances are imported per year. As the above test results present the best case, the actual volumes must be assumed to be higher.

5.7 Legal Compliance of the Imports

5.7.1 Nationality of Importers and UEEE

Imports by NESREA-Licensed Importers
Almost all of the importers or their agents are Nigerians, of which 80% are located within the Lagos metropolis, followed with large distance (3%) by Abuja. The location of around 10% of importers is unknown, while other importers reside in 19 other locations in Nigeria, with less than 1% each. They work in personal networks with the exporters, many of them also Nigerians.

The PiP obtained a list of importers who are registered at NESREA to import UEEE as of January 2017. The names of each of the registered companies were searched for in the shipping manifests of the importations of UEEE. For the period of this project (January to April 2015 and January to December 2016), the registered importers accounted for just 75 of the 2,145 UEEE imports in containers, which is around 3% of the total number of imports. The weight of the UEEE imports by these importers amounted to around 710 t, which is about 3.9% of the 18,300 t of UEEE imported in containers. This points to a high degree of non-compliance with regulations, even more so when considering that much UEEE is not declared correctly or completely undeclared. The PiP observed from NPA shipment manifests that some of the companies licensed by NESREA to import UEEE were also importing UEEE in containerized vehicles, as well as importing vehicles only.

One reason for the low percentage of imports by NESREA registered importers may be explained by the fact that most importers of used vehicles who stuff the containers with UEEE may only be registered as importers of vehicles and not as importers of UEEE. Another reason may be that importers want to avoid the registration fee of 150,000 Naira (around 415 €, status August 2017), with an annual renewal fee of 50,000 Naira (140 €) for the registration.

5.7.2 Import of CRTs and Refrigerators with (H)CFC

Even though NESREA regulations ban the import of CRT-devices, their import continues, mostly incorrectly declared or undeclared. During the PiP period, CRTs in different forms (TVs and computers) were imported, but the PiP did not observe the confiscation or the return of such imports or any other imports that may not have complied with the provisions of the regulation when they were discovered during inspections.

The same applies to the importation of used refrigerators with (hydro) chloro fluoro carbons ((H)CFC), which, despite an import ban, are still imported.

FIGURE 20 // IMPORTATION OF REFRIGERATORS IN VEHICLE

Refrigerators and other white goods were often imported via vehicles, i.e. trucks, vans, and cars, despite restrictions on refrigerator imports. Generally, when the quantity is not more than three in a car or bus, it attracts minimal attention from the customs. However, the importation of larger quantities, e.g. in trucks, attracts high duty charges.

5.8 Economic Aspects of UEEE Imports

5.8.1 Economic Relevance of UEEE Trade, Refurbishment, and Recycling

The relatively high poverty level in many parts of Nigeria has left many Nigerians with no other choice than to utilise used electrical electronic equipment and be involved in their trade to meet some of their basic income needs for sustenance. UEEE from the EU and the USA is perceived as being of good quality and, depending on the brands, is attractive. Besides limited purchasing power, Nigerians may prefer buying UEEE rather than new products due to frequent power cuts and irregularities in the public power grid, which stress or even destroy electrical and electronic equipment.

These conditions create a market that favours cheap UEEE over new equipment, and create a market for UEEE that attracts UEEE imports, capitalizing on the higher reuse value of UEEE in Nigeria compared to the recycling value in some of the countries of origin.

The high skill level of Nigeria's refurbishing sector, with the ability to fix many technical defects in UEEE at reasonable service cost, also motivates importers to import both functioning and non-functioning electronic equipment to Nigeria. Many imported UEEE are sold to buyers in non-tested condition, and they often cannot test them before buying. It is a transaction based on lower prices for such untested equipment, good luck, and trial and error. If a buyer is lucky, the UEEE will function from the outset. The high competence of the refurbishing sector motivates many buyers to engage in such transactions. A very high percentage of non-functioning imported UEEE are fixed successfully according to a report by Odeyingbo (2011). Imported UEEE is also sold to shop owners or distributors who then possibly repair non-functioning devices before they sell it at higher prices, compared to non-tested UEEE.

The cost of repairing the same equipment in, for example the UK or Germany, is far higher compared to the cost in Nigeria. Labour work charges in Germany are paid per hour, and the hourly rates are high when compared to the cost of new UEEE and to total repair cost in Nigeria. Spare parts from used equipment may not be available in Germany, so replacement parts must often be sourced as new components, if they are available at all. Often the high cost of buying these parts from manufacturers, as well as repair costs, drives consumers to buy new instead of repairing old products. Meanwhile repairers in Nigeria have access to spare parts from nonfunctional UEEEs. These factors altogether make it economical and thus attractive to repair UEEE in Nigeria when compared to the situation in Germany or other richer countries.

5.8.2 Cost and Revenues of UEEE Imports

In order to have a more comprehensive understanding of the drivers of the imports, cost and revenues for the importers were assessed. The shipping cost is based on the size of the containers, not on weight. Making better use of the size/volume thus decreases the shipping cost per imported item. The same applies to the import of UEEE with RoRo-vehicles. The UEEE and other goods stuffed inside the vehicles do not increase the shipping cost but increase the importers' revenues, compared to a vehicle import without UEEE or other goods.

The following most economically relevant costs and revenues were assessed:

- Acquisition cost of UEEE, e.g. in Germany;
- the cost of UEEE acquisition in the country of origin, including transportation to the port of export;
- Shipping costs: organising the logistic of loading, transport, and booking of freight;
- Nigerian VAT (7% for imports) and 0.5% surcharge depending on the values declared on the invoice;
- Cost of clearing the container, which includes the payment of import duty, terminal charge, transport, and logistics to desired destination;
- Other charges the importer has to pay include levies where applicable, ETLS [10] (0.5%) and 7% charges for customs;
- Cost of off-loading at point of discharge;
- Revenues from the sales of the imported UEEE

All calculations in this chapter are based on the assumption that the importer pays the designated amounts of all official import taxes and fees. As this assumption may not fully apply, the actual profits for the importers may be higher than calculated.

[10] ECOWAS Trade Liberalisation Scheme

Other costs for the importers that could not be taken into account:

- Rent for shop;
- Wages of employees engaged to sell the imported UEEE;
- Other minor costs such as business premises permit, waste management dues, association levies, security levies, and electricity bill, etc.

The prices of UEEE were assessed at the first point of sale in Nigeria. The price of UEEE depends on its quality/functionality and the brand. Brands with higher reputation and better customer perception attract higher market values than other brands.

Table 20 illustrates how the prices for products, in this case for laptops, depend on brand and condition.

TABLE 20 // RETAIL PRICES OF IMPORTED USED LAPTOPS ACCORDING TO BRAND AND CONDITION (STATUS 2016)

Condition of the laptop	Price (Naira/Euro)			
	COMPAQ	**DELL**	**HP**	**MAC**
Functional but outdated	22,155/63	26,305/75	24,694/70	90,750/259
Functional, in good condition	29,638/85	47,500/135	43,083/123	144,305/412
Functional, in bad condition	19,238/55	23,500/67	17,416/49	89,933/257
Un-tested, in good condition	15,683/45	14,583/42	11,611/33	43,527/124
Nonfunctional, in good condition	10,133/29	12,944/36	9,861/28	32,500/93
Nonfunctional, in bad condition	5,322/15	9,016/25	6,483/18	21,944/62

The exporters, who in many cases cooperate in personal networks with the importers – most of them Nigerians - generally purchase UEEE untested in the country of export from informal collectors. The table illustrates that the import of UEEE in RoRo-vehicles does not generate profit for itself, but reduces the cost for the import, or the profit from the sales of the used vehicles, in case the importer will not use them for himself. The imports of UEEE in containers with vehicles can have considerable value as well, but may not be enough to fully pay for the import.

The imports of UEEE in containers can generate considerable profits, depending on the types and amounts of UEEE in the container, but also depending on whether the importer can sell the UEEE for reuse, for repair, or only for recycling. The importer's principal sales options are selling the imported PCs in Nigeria for reuse, e.g. to an end-user or a retail shop, for repair/spare parts to a workshop, or for recycling to a scavenger who sells the valuable materials and disposes of the other materials for free.

TABLE 21 // ESTIMATION OF SHIPPING COST/PROFIT OF UEEE FROM ESSEN, GERMANY, TO LAGOS, NIGERIA (EXCL. PURCHASES AND SALES OF THE VEHICLES)

Shipment mode	Loading	No.	Average UEEE acquisition cost Germany	Average sales price Nigeria (Naira)	Average sales price Nigeria (Euro)	Logistic to port of export and Nigeria	Cost in Nigeria (Naira) incl. taxes, fees, transport to Alaba	Revenues from UEEE sales in Nigeria (Euro)	Overall cost/ profit (Euro, excl. sale of vehicle)
Car (RoRo)	Refrigerator	2	33 €	27,683	86 €				
	LCD TV	10	60 €	27,333	85 €				
	Cooker	12	8 €	4,500	14 €	460 €	1,092 €	499 €	-1,100 €
	Kettle	10	4 €	2,500	8 €				
	Pressing iron	10	2 €	1,000	3 €				
	DVD player	5	4 €	2,000	6 €				
Bus (RoRo)	Refrigerator	6	33 €	27,683	76 €				
	Washing Machine	1	35 €	30,000	83 €				
	LCD-TV	10	60 €	27,333	75 €	560 €	1,185 €	1,129 €	-620 €
	Cooker	20	8 €	4,500	12 €				
	Air conditioner	5	35 €	55,000	151 €				
	Pressing iron	10	2 €	1,000	3 €				
Big Bus (RoRo)	Refrigerator	7	33 €	27,683	86 €				
	LCD-TV	20	60 €	27,333	85 €				
	Washing machine	2	35 €	30,000	94 €	900 €	1,404 €	1,235 €	-1,100 €
	DVD	30	4 €	2,000	6 €				
	Cooker	20	8 €	4,500	14 €				
	Pressing iron	20	2 €	1,000	3 €				
Truck (RoRo)	Refrigerator	30	33 €	27,683	86 €				
	LCD-TV	20	60 €	27,333	85 €				
	Kettle	50	4 €	2,500	8 €	2,500 €	3,743 €	5,213 €	-1,000 €
	Pressing iron	30	2 €	1,000	3 €				
	DVD	50	4 €	2,000	6 €				
	Air conditioner	20	35 €	55,000	172 €				
20 ft Container	Refrigerator	50	33 €	27,683	86 €				
	Microwave	15	6 €	10,555	33 €				
	DVD Player	100	4 €	2,500	8 €				
	Pressing Iron	100	2 €	1,000	3 €	1,800 €	3,120 €	11,538 €	6,600 €
	CRT TV	40	6 €	7,000	22 €				
	Flat screen	25	14 €	10,000	31 €				
	Speakers	50	10 €	8,000	25 €				
	LCD TV	80	60 €	27,333	85 €				
	Printer	30	12 €	14,000	44 €				
	Audio player	80	15 €	15,000	47 €				
	Cooker	100	8 €	4,500	14 €				
40 ft Container	Refrigerator	80	33 €	27,683	86 €				
	Microwave Oven	100	6 €	10,555	33 €				
	Cooker	100	8 €	4,500	14 €				
	DVD player	100	4 €	2,500	8 €				
	Air conditioner	40	35 €	55,000	151 €				
	Pressing iron	200	2 €	1,000	3 €	2,100 €	7,799 €	25,290 €	15,400 €
	CRT TV	50	6 €	7,000	22 €				
	Flat screen	50	14 €	10,000	31 €				
	LCD-TV	150	60 €	27,333	85 €				
	Audio player	50	15 €	15,000	47 €				
	Laptop	100	40 €	30,000	94 €				
40 ft Container with Bus and Car	CRT TV	20	8 €	7,000	22 €				
	Pressing iron	100	2 €	1,000	3 €				
	Speakers	50	10 €	8,000	25 €				
	Audio player	50	8 €	5,150	16 €				
	DVD player	100	4 €	2,500	8 €				
	Printer	40	8 €	14,000	44 €	2,100 €	7,799 €	7,233 €	-2,700 €
	Flat screen	50	14 €	10,000	31 €				
	Refrigerator	15	33 €	27,683	86 €				
	Microwave oven	20	6 €	10,555	33 €				
	Cooker	50	8 €	4,500	14 €				
	Air conditioner	10	35 €	55,000	172 €				

FIGURE 21 // IMPORT OF UEEE IN CONTAINERS WITHOUT AND WITH VEHICLES

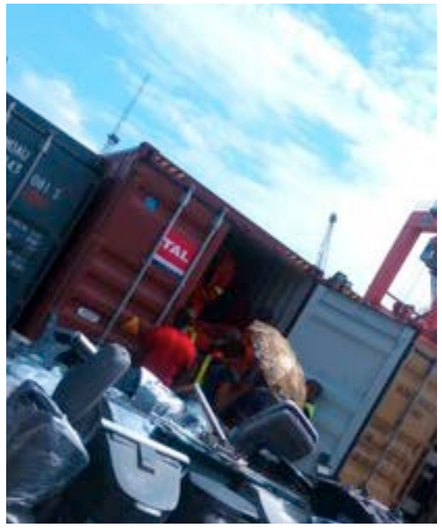


Table 22 shows the economic balance considering different acquisition and sales options for a container with 2,100 desktop computers without monitors that were transported in a 40 ft container from Essen, Germany to Lagos, Nigeria. Besides purchasing UEEE in Germany, a possible scenario is that a person, often a Nigerian, living in Germany collects used desktop PCs and ships them to Nigeria once there are enough to fill a container. In this case, the purchasing cost would be low or close to zero, not taking into account the time the person might spend with the collection activity.

TABLE 22 // IMPORTERS' PROFITS FOR DIFFERENT ACQUISITION AND SALES SCENARIOS (PRICES AND EXCHANGE RATES FROM MID-2016)

Acquisition in Germany	Purchased	Purchased	Purchased	Purchased	Collected for Free
Sellable in Nigeria as	100% for reuse	75% reuse, 25% repair	25% reuse, 75% repair	50% reuse, 25% repair, 25% recycling	100% recycling
Purchasing Cost for 2,100 PCs	35,700 €	35,700 €	35,700 €	35,700 €	0 €
Cost of Freight and Clearing	9,240 €	9,240 €	9,240 €	9,240 €	9,240 €
Total Cost	44,900 €	44,900 €	44,900 €	44,900 €	9,200 €
Average Sales Price in Nigeria (Naira)	12,000	10,750	8,250	8,250	2,000
Average Sales Price in Nigeria (Euro)	37 €	34 €	26 €	26 €	6 €
Revenues from Sales (Euro)	78,600 €	70,400 €	54,000 €	54,000 €	13,100 €
Total (Euro)	**33,700 €**	**25,500 €**	**9,100 €**	**9,100 €**	**3,900 €**

As containers and vehicles generally contain various types of UEEE often mixed with other goods, the above scenario is an ideal and not representative for UEEE imports. The table shows, however, that computers are valuable UEEE for importers, and that the importers' profit largely depend on how many of the imported items can be sold for reuse or at least for repair. The scenario is different if the importer can collect the UEEE for free in Germany. Even in the worst case scenario that 100% of the PCs can only be sold for recycling, the balance is still positive.

The importers' profit also largely depends on the exchange rate of the Nigerian currency, the Naira, to the Euro [11], US-Dollar, or other "hard" currencies. While the logistics cost and possibly part of other import expenses like taxes have to be paid in Euro, US-Dollars, etc., the importers' revenues will be in Naira. Calculating the costs and revenues with the current exchange rate for the Naira to the Euro , and assuming the same sales prices for the PCs in Nigeria, would reduce the importer's profit considerably, as illustrated in Table 23.

TABLE 23 // DEPENDENCE OF IMPORTERS' PROFITS FROM NAIRA EXCHANGE RATES

Acquisition in Germany	Purchased	Purchased	Purchased	Purchased	Collected for Free
Sellable in Nigeria as	100% for reuse	75% reuse, 25% repair	25% reuse, 75% repair	50% reuse, 25% repair, 25% recycling	100% recycling
Total (Euro)	**24,400 €**	**17,200 €**	**2,700 €**	**2,700 €**	**2,400 €**

The importers' profits thus highly depend on the currency exchange rate of the Nigerian Naira with the USD and Euro. Figure 24 in Appendix 4 shows that the Naira became very weak against the Euro at the end of the first half of 2016, and since then has remained weak. The above findings make it plausible that UEEE imports may have become considerably less attractive for importers since mid-2016 at the latest.

The magnitude of profits for importers in the above tables reflects the situation for the imports of UEEE that have a high value compared to their volume. Mobile phones, LCD-TVs and monitors, photocopy machines, etc. may be similar in this respect. Other UEEE, like electric kettles, cookers, and printers, will attract much lower prices. For these types of UEEE, the importer depends even more on importing UEEE in good quality and selling it for reuse, as otherwise the overall balance may become negative. It can be assumed, however, that this will not motivate exporters and importers to properly test and package the devices prior to export, as this would have to happen in the countries of export with generally higher labour and other costs. Appendix 2 provides more information on the purchasing cost of UEEE in Germany and wholesale and retail prices in Nigeria to give further insights into the profit margins of the UEEE import and trade business.

[11] 364 Naira for 1 Euro (status 2 August 2017) instead of 321 Naira in July 2016

6 CONCLUSIONS

6.1 Volumes and Routes of UEEE Imports into Nigeria

Around 18,300 t of UEEE were assessed to be imported per year in containers: around 8,800 t in containers without vehicles and 9,500 t in containers with vehicles. Due to suspected underdeclaration of the total weight of containers and a share of missing import documents exceeding the 9.5% taken into account, the actual UEEE imports in containers could be higher, although not to a degree that would crucially affect the assessed total volume of UEEE imports. The assessed 18,300 t of UEEE import in containers should be considered a minimum.

The import of UEEE in RoRo-imported vehicles was found to be the main import route for UEEE. It was assessed with 41,500 t per year. Due to data uncertainties, the actual amounts of UEEE imported via this channel could be more or less (c.f. section 5.2.4 on page 31). In the absence of further hard data, it was impossible to calculate a reliable range for these UEEE imports.

The available data points to actual UEEE imports of around 60,000 t of UEEE per year, with a higher uncertainty related mainly to the UEEE imports in RoRo-vehicles. However, the import of UEEE in RoRo vehicles remains a main, or at least a relevant, import route in any circumstance.

EU member states were the origin of around 77% of UEEE imported into Nigeria. Germany, the UK, Belgium, The Netherlands, Spain, China, the USA, and Ireland account for around 85% of all UEEE imports. The EU is the source of 98% of UEEE imports in RoRo-vehicles into Nigeria, while China (44%) leads the exports of UEEE in containers without vehicles, the USA (32%) the exports in containers with vehicles. Even though the shares and positions of these eight countries in the export ranking slightly change with the various sensitivity test scenarios, they remain the main exporters of UEEE with significant distance from other countries.

The 60,000 t of annual UEEE imports estimated in this report do not include other importation routes, for example via land transport from neighbouring countries across the borders of Nigeria or via air cargo. Since such imports are related to much higher efforts and costs, it is assumed, however, that such imports are of minor relevance compared to the imports via the two ports in Lagos, which are the hub of UEEE imports into Nigeria.

Compared to earlier publications (c.f. Table 1 on page 10), which indicate much higher volumes, about around 10 times higher, the 60,000 t of annual UEEE imports assessed in this report are low. This applies even more so when taking into account that those studies have not quantified the UEEE imports in RoRo-vehicles, which in this assessment were found to be the main import route. The earlier studies are, however, either based mainly on trade statistics, or on much shorter assessment periods, both for container inspections as well as for the review of import documentation compared to the PiP project. None of the previous studies could clearly and consistently distinguish between UEEE and new EEE. A possible other, or at least additional, explanation for the higher import figures in those studies may therefore be that much more new EEE than UEEE is imported via containers, so that those studies in fact assessed imports of EEE to a higher degree while the PiP project could focus solely on UEEE.

Most of the previous studies go back to import data from 2010. The Comtrade data in Figure 22 in Appendix 4 show a clear peak in the imports of (U)EEE into Nigeria in 2010, which declined thereafter and increased slightly again in 2014. Data for 2015 and 2016 are not available. Figure 25 in Appendix 4 illustrates that the annual growth rate of the Nigerian gross domestic product was around four to eight percent between 2008 and 2014, with around eight percent in the period from 2009 to 2011, but sharply declined after 2014 to even negative rates in 2016. Another reason for the lower imports of UEEE could be that the economic decline in the past years decreased the buying power of Nigerian people, thus damping the demand for UEEE. The imports of UEEE can generate considerable profits, which depend on the quality and the brand of the UEEE, and on the exchange rate of the Nigerian currency, the Naira, with the US-Dollar and the Euro. The weakness of the Nigerian currency subsequent to the economic slowdown since at least mid-2016 increased the cost of imports for the importers. Persons having worked in the ports for a long period already reported that they had indeed observed a considerable decrease of activities in the ports compared to the situation prior to the crisis, which supports the above considerations. Thus overall, the UEEE imports in 2015 and 2016 can be assumed to be actually lower compared to previous years.

The 60,000 t may represent an exceptional slump in the last years, so that it can be expected that the imports will increase again once the Nigerian economy and the national currency recover. In any case, due to the trend to underdeclare the weight of imports in import documentation, the assessed 60,000 t of UEEE imports should be considered a minimum, while also taking into account that the import of vehicles – the RoRo-imported vehicles being the main importation route - seems to have been weaker in the past years after 2010, as displayed in Figure 23 in Appendix 4. With increasing imports of used vehicles, the imports of UEEE could increase as well.

6.2 Enforcement of Legislation

Most of the UEEE imported in containers is clean and undamaged but improperly packaged and some with cut cables. Basic testing showed that most types of imported UEEE are at least partially functional but a fraction still remains nonfunctional, meaning that every year Nigeria may have imported around at least 15,700 t of e-waste, most of it LCD-TVs containing mercury and refrigerators, as well as air conditioners containing (H)CFCs. Most imported UEEE is falsely declared or even undeclared in import documents, the latter applying in particular to UEEE imports in containers with vehicles, and even more so for RoRo-imported vehicles.

These findings prove that the stipulations of the Basel Convention, Nigerian import legislation, as well as, at least in the case of exports from the EU, the shipment regulations of the WEEE Directive are infringed on a daily base without consequences. The NESREA ban of CRT-devices is not enforced either. Considerable volumes of CRT-devices are still shipped to Nigeria and are allowed to enter the country. Similarly, despite the ban, used refrigerators with (H)CFC leave the countries of export and are allowed into Nigeria.

There is a need to review the container inspection approach and methodology at he ports. The present approach is not thorough and effective, as it does not allow comprehensive examination of imports. The inspections and controls should be strengthened for RoRo-imported vehicles, which has shown to be a highly important UEEE import route in 2015 and 2016.

Importers widely ignore the obligation to register at NESREA. Only around 3% of the UEEE importers are actually registered, meaning that around 97% of imports of UEEE in containers are initiated by unregistered importers, but without any consequences. Adding to that are the large amounts of UEEE entering Nigeria with RoRo-imported vehicles. For any e-waste legislation and management based on extended producer responsibility (EPR), a proper registration of producers and importers would be essential to enable a secure and fair financing of such a system.

An EPR-financed e-waste management system in Nigeria would also require a reliable and consistent assessment and registration of imported UEEE in terms of device type and volume. This would require a considerable upgrade of controls and possibly incentives for importers to ensure proper declaration of imported UEEE. The results of the PiP project show that the current situation cannot be the base for a fair and accepted EPR-system. NESREA and NCS should therefore tighten their cooperation and increase their efforts to enforce the registration obligation and the proper declaration of imported UEEE in containers and in RoRo-vehicles.

The situation demonstrates a lack of enforcement of national and international legislation in the exporting countries, as well as in Nigeria. E-waste, (H)CFC fridges, and other banned items should never leave the countries of export, at least not from the EU where such exports are banned. It is, however, impossible for the exporting country, as well as for Nigeria, to monitor and control each and every import. The import of e-waste and other banned items probably cannot be reduced to zero.

It could be helpful to make certificates of functionality testing an obligatory part of the import documents required for the transports of goods from the exporting to the importing countries. The shipping lines could then be legally obliged to not accept containers and RoRo-vehicles that carry UEEE without such certificates. So far, the EU legally requires exporters to have such certificates available on request, and the situation is similar in Nigeria. Other exporting countries may not even have such legal requirements. The currently low risk of being controlled may encourage exporters and importers to forego such testing. Making testing certificates an obligatory part of the shipping documents would also then require a standard functionality test for each type of UEEE that is accepted by both exporting and importing countries.

It will require increased willingness on each side and serious cooperation between the exporting countries, in particular the EU, and Nigerian competent authorities. To enforce legislation at the port of export and in Nigeria, monitoring and controls must produce sanctions that exporters and importers have to reckon with and thus avoid illegal actions and improper declarations of exported/imported UEEE. Making effective use of the customs' internationally applied database ASYCUDA could be a first step for international enforcement cooperation.

There is a need to review the consequences of loose environmental enforcement and economic priorities. It is essential for Nigeria to balance both key issues in order to have a more sustainable development. While international cooperation is required, the Nigerian Government has leverage to improve the situation, since almost all UEEE imports are initiated by Nigerians. Effective training of UEEE importers on the need to import only functional UEEE, proper loading and packing, proper declarations of goods, and the need to import devices without removing the power cords/cables etc. could be the first step in Nigeria, flanked by severe enforcement activities and sufficiently painful fines and/or incentives to make importers respect the rules. The exporting countries should follow the same path to minimize illegal exports from their countries.

The results were presented to the Nigerian Government in a workshop in May 2016. It was agreed to set up a working group including key actors in Nigeria: Federal Ministry of Environment, NCS, NESREA, NPA, UEEE importers, Recyclers, Academia, NGOs, Police, with support from BCCC Africa. The core intention of the working group is to work with motivated and benevolent representatives in the various competent authorities and other stakeholders, to make changes in the system and to move towards a better prevention of e-waste imports. The group could also be the nucleus of a permanent working group addressing challenges and promoting the implementation of solutions for a sound e-waste management in Nigeria. As for enforcing the importers' registration obligations at NESREA – also in the light of an extended producer responsibility scheme for e-waste management in Nigeria - a better and more effective cooperation between NESREA and NCS was seen to be essential. Exporting

countries could be requested to assist in identifying and doing business with only those importers into Nigeria who are properly registered. Strengthening the capacity of the Nigerian National Toxic Waste Dump Watch Committee could be a valuable step to better monitor clandestine importations and the dumping of e-waste and other hazardous wastes, and to better enable NESREA to send back such imports to the port of origin.

It was also discussed to reactivate the West African Network for Environmental Compliance and Enforcement (WANECE), which targeted capacity building in West African environmental institutions and officials to adequately enforce environmental regulations. The WANECE, as well as the working group to be established in Nigeria, could cooperate with international organisations like Interpol and Impel, who are involved in the prevention of e-waste exports from the EU and other parts of the world, in order to efficiently and effectively enable trade of functioning UEEE and prevent e-waste exports.

6.3 Replicability of the Study Approach

The methodology developed in this project could be adapted and replicated in other developing countries with similarly complex situations like Nigeria. The combination of import data and physical inspection gives a better overview of the UEEE and WEEE shipments, as well as the characteristics of such imports compared to pure trade statistics, which do not differentiate UEEE from EEE and give no insights into the functionality of the imported UEEE.

Access and use of the customs database (ASYCUDA) would, however, reduce the required efforts for the assessment and evaluation of import documentation in particular, as it contains detailed information about the imports and would allow electronic searches for keywords, thus saving the work of manually going through printed import documents. Still, the combination with inspections is essential to identifying wrong declarations of UEEE imports. In any case, the cooperation of the main stakeholders like customs and port authorities, as well as of enforcement agencies, is essential for the success of such projects.

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8 APPENDIX 1: ASSESSMENT OF UEEE IMPORTED WITH RORO-VEHICLES

Typical contents of imported vehicles depending on the vehicle type could be:

- For cars, a mix of large UEEE and small UEEE, for example 2 photocopiers, 2 refrigerators, or 2 washing machines, and 2 TV sets or 5 CRT.
- For a bus, 6-9 refrigerators, 2-4 washing machines, 20 LCD TVs, and other smaller items such as electric kettles, electric pressing irons, electric cookers, DVDs.
- For a truck, 32-50 refrigerators, 30-50 LCDs, and other non -UEEE goods such as vehicle spare parts, mattresses, cloths, bicycles, and small furniture.

Table 24 details the number of vehicles and their contents.

TABLE 24 // SUMMARY OF NUMBER OF VEHICLES AND WEIGHT OF UEEE OBSERVED/ IMPORTED AT FIVE STAR LOGISTIC TERMINAL AND PTML FOR PIPI AND PIP2

Categories of vehicle	Total number of vehicle inspected	Number conveying UEEE (percent)	Total number assessed with direct physical access to vehicle content	Average weight of UEEE assessed with direct physical access to vehicle content (kg)
Car	1,020	497 (48.7%)	276	69,398
Bus	756	421 (55.7%)	169	111,751
Truck	408	277 (67.9%)	80	141,547
Total	**1165,02**	**1,195 (54.7%)**	**525**	**322,696**
Average			**Average weight of Physical Examination**	**614.6**

The figures below were used to calculate the annual imports based on the total amount of vehicles imported into Nigeria in the average of the years 2015 and 2016.

Total Number and weight (kg) of vehicle assessed using assessment profile for vehicle investigation	Total weight (kg) of UEEE in vehicle assessed	Proportion of all vehicle conveying UEEE
67x 100 = 6,700		41.58% of vehicles conveying UEEE were cars
40x175 = 7,000		
32x222 = 7,104		
20x 216 = 4,320		
40x255 = 10,200		
10x321 = 3,210		
12x283 = 3,396		
Total = 41,930		
32x 660 = 21,120		
36x568 = 20,448		
15x531 = 7,965		
48x562 = 26,976		
25 x528 = 13,200		
35x 380 = 13,300		
61x304 = 18,544		
Total =100,433	111,751+100,433=212,184	
37x1,540 = 56,980		
27x1,546 = 41,742		
28x1,595 = 44,660		
15x2,647 = 39,705		
30x1181 = 35,430		
26x1165 = 30,290		
34x1261 = 42,874		
Total = 291,681	141,547+291,681=433,228	
	756,740	

Table 25 gives an overview of the country of origin of the inspected vehicles.
The available time and circumstances of the inspections did not allow functionality tests.

TABLE 25 // CONTENT AND CONDITION OF RO-RO-IMPORTED USED VEHICLES DURING THE PROJECT PERIOD

S/	Country of origin	Number observed per country	Number conveying UEEE	Category/ type of vehicle imported	List of imported items	Condition
1	Germany	498	336	Car - 129 Bus - 137 Truck - 70	refrigerator, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven, photocopy machine, printer, machiner	Very clean - 20% Clean – 50% Dirty - 20% Very dirty - 10%
2	United Kingdom	472	291	Car - 123 Buses - 116 Truck - 52	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, photo-copy machine, power generators, microwave oven	Very clean - 10% Clean – 45% Dirty - 35% Very dirty - 10%
3	Belgium	250	150	Car – 60 Buses – 50 Truck – 40	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, printer, power generators, microwave oven	Very clean - 10% Clean – 60% Dirty - 20% Very dirty - 10%
4	Netherlands	217	140	Car - 78 Buses - 27 Truck - 35	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven	Very clean - 20% Clean – 50% Dirty - 20% Very dirty - 10%
5	United States of America	50	23	Truck -23	microwave, electric stove, desktop computer ,TV	Very clean -10% Clean – 60% Dirty - 20% Very dirty - 10%
6	Ireland	170	105	Car - 36 Buses - 37 Truck - 32	CRT TV,LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, printer, power generators, microwave oven	Very clean – 10% Clean – 50% Dirty - 30% Very dirty - 10%
7	Italy	53	18	Car – 12 Buses – 1 Truck – 5	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven	Very clean – 0% Clean – 60% Dirty - 35% Very dirty - 5%
8	Spain	200	62	Car – 30 Buses -20 Truck - 12	CRT TV, LCD TV, refrigerator, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven	Very clean - 20% Clean - 50% Dirty - 20% Very dirty - 10%
9	Denmark	24	9	Car -7 Buses - 2	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven	Very clean - 20% Clean - 50% Dirty - 20% Very dirty - 10%
10	Poland, Finland, France	250	61	Car - 22 Buses - 31 Truck - 8	CRT TV, LCD TV, smart phone, washing machine, DVD, electric cooker, LCD TV, CRT TV, electric kettle, power generators, microwave oven	Very clean - 20% Clean - 50% Dirty - 20% Very dirty - 10%

The table shows that around 60% to 70% of UEEE in the inspected vehicles from all the above countries was clean or even very clean, while 30% to 40% appeared dirty or very dirty.

9 APPENDIX 2: COST OF UEEE FOR IMPORTERS IN GERMANY AND SALES PRICES IN NIGERIA

Table 26 gives an overview on wholesale prices of various types of UEEE in Nigeria depending on their quality.

TABLE 26 // AVERAGE WHOLESALE PRICES OF UEEE IN NIGERIA DEPENDING ON QUALITY (STATUS 2016)

UEEE type	Functional and in good condition (Naira/Euro)	Functional but outdated (Naira/Euro)
Air conditioner	75,000/214	47,500/135
Deep freezer	84,208/240	47,958/137
DVD	4,866/14	3,525/10
Electric kettle	3,400/14	2,333/7
Laptop	51,875/148	42,291/120
LCD TV 32 inches	45,208/129	32,083/92
Microwave oven	18,150/51	15,350/44
Photocopy machine	45,375/130	30,208/86
Pressing iron	3,275/9	1,950/5
Printer	14,266/45	9,966/28
Speaker	14,150/40	12,408/35
Stereo	8,466/24	7,383/21

Table 27 shows the importers' UEEE purchasing prices in Germany and average sales prices of UEEE in Nigeria to give insights into the profit margins of the UEEE import and trade business.

TABLE 27 // AVERAGE PRICES OF UEEE IN NIGERIA (STATUS 2016)

UEEE Type	Average Purchasing Price in Germany (Euro)	Importer Sales Price Naira/Euro	Wholesale Sales Price Naira/ Euro	Retailer Sales Price Naira/Euro
DVD	4 €	2,000 NGN/6 €	4,800 NGN/14 €	6,000 NGN/17 €
Electric kettle	4 €	2,500 NGN/7 €	3,500 NGN/10 €	7,000 NGN/20 €
Electric cooker	8 €	4,500 NGN/12 €	4,766 NGN/14 €	6,000 NGN/17 €
Laptop	40 €	30,00 NGN/83 €	37,500 NGN/107 €	45,000 NGN/128 €
LCD TV 32 inches	60 €	27,333 NGN/75 €	45,208 N GN/129 €	55,000 NGN/157 €
Microwave oven	6 €	10,555 NGN 30 €	18,150 NGN/51 €	20,000 NGN/57 €
Plasma TV	30 €	17,500 NGN/50 €	27,141 NGN/77 €	40,000 NGN/114 €
Pressing iron	2 €	1,000 NGN/3 €	3,275 NGN/9 €	4,000 NGN/11 €
Printer	8 €	14,000 NGN/39 €	16,000 NGN/45 €	16,500 NGN/47 €
Refrigerator	33 €	27,683 NGN/76 €	63,125 NGN/180 €	65,000 NGN/185 €
Speaker	10 €	8,000 NGN/22 €	15,000 NGN/43 €	18,000 NGN/51 €
Audio player/Stereo	8 €	5,150 NGN/16 €	8,466 NGN/24 €	10,000 NGN/29 €
Vacuum cleaner	10 €	6,111 NGN/18 €	9,000 NGN/25 €	17,000 NGN/48 €
Washing machine	35 €	30,000 NGN/83 €	40,000 NGN/114 €	45,000 NGN/128 €

10 APPENDIX 3: TERMINALS AND OPERATORS IN THE LPCA AND TCIPC

In accordance with the concession policy of the Federal Government of Nigeria on all ports in the country, the LPCA currently houses four formally licensed private terminal operators managing the six terminals A to E and the container terminal. Major cargos discharged at the port include: bulk cement, bulk fertilizer, wheat, fish, rice, vegetable oil, petroleum products, and various containerized cargoes. Table 28 provides an overview on the various terminals and their main cargos.

TABLE 28 // TERMINALS AND MAIN CARGO HANDLED AT THE LAGOS PORT COMPLEX APAPA [12]

Terminal Name	Operators	Operation area	Main goods	Website
A	Apapa Bulk Terminal Limited "A",	5.913 hectares (ha)	dry bulk cargo; general cargo; liquid cargo; containers	http://www.fmnplc.com/abt/index.php
B	Apapa Bulk Terminal, Limited "B"	5.752 ha	dry bulk cargo; general cargo; liquid cargo; containers	http://www.fmnplc.com/abt/index.php
C	ENL Consortium "C"	11.211 ha	general cargo; bulk/break bulk cargo; palletized/unitized cargo; container handling; vehicles; liquid bulk	http://www.port.enlconsortium.com/Home.aspx
D	ENL Consortium "D"	10.549 ha	as stated above	http://www.port.enlconsortium.com/Home.aspx
E	Greenview Development Nigeria Limited.	19.091 ha	bulk cargo operations, ,containerization	http://dangote.com/ourbusinesses/portoperations.aspx
Container Terminal	APM Terminals Limited	59.41 ha	container handling (records very high influx of containers)	http://www.apmterminals.com/en/operations/africa-middle-east/apapa
Bull nose 1,2,3	Eko Support Service	3.633 ha	oil and gas support base	http://ekosupportservices.com/
Ijora Lilipond	Lilipond Container Depot Nigeria Ltd	13.60 ha	general cargo	Not available

The TCIPC is located north west of the LPCA. It has five terminals: terminals A to D and the PTML terminal. The terminals are also named after the operators formally licensed to operate them, as illustrated in Table 29.

TABLE 29 // OVERVIEW OF PORT TERMINALS INSIDE THE TIN CAN-ISLAND PORT COMPLEX [13]

Terminal Name	Operators	Operation Area	Main Goods	Website
A	Josepdam Port Services Limited	Berth: 1, 1A & 2 Quay length 484 m	bulk cargoes, general cargoes and occasionally containers	Not available
B1 and B2	TinCan Island Cont. Terminal Limited	Berth: 3, 4, 4A and 5 Quay length 764.64 m	containers	Not available
C1 and C2	Port and Cargo Handling Services Limited	Berth: 6, 7, 7a & 8 Quay length 789.3 m	general cargo and container	http://www.sifaxgroup.com
D1 and D2	Five Star Logistics Limited	Berth: 9 & 10 Quay length 437.03 m	containers, general cargoes and vehicles	http://www.5starterminal.com
PTML	Ports and Terminal Multiservices Ltd	Quay length 490 m	containers, general cargoes and RoRo vehicles	http://www.ptml-ng.com

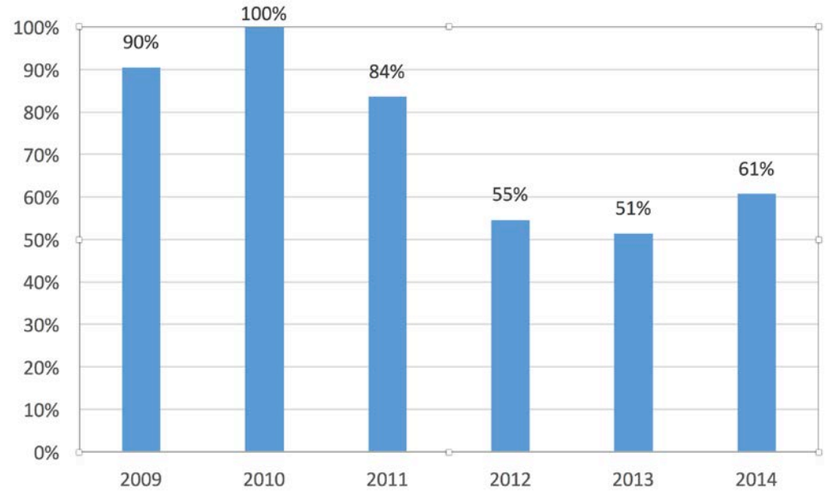
[12] Nigeria Ports Authority, information retrieved from http://www.nigerianports.org/defaultLagosPort.aspx

[13] Source: Nigeria Ports Website http://www.nigerianports.org/defaultTinCanPort.aspx

11 APPENDIX 4: ECONOMIC STATISTICS

Figure 22 shows the development of (U) EEE imports into Nigeria for the years 2009 to 2014 as percentages of import values based on USD in 2010, which was the year with the highest import volumes (around 6.6 billion USD). The data are based on the COMTRADE database and do not differentiate used and new EEE. The values are not complete for all years and should thus only be understood as a trend indicator.

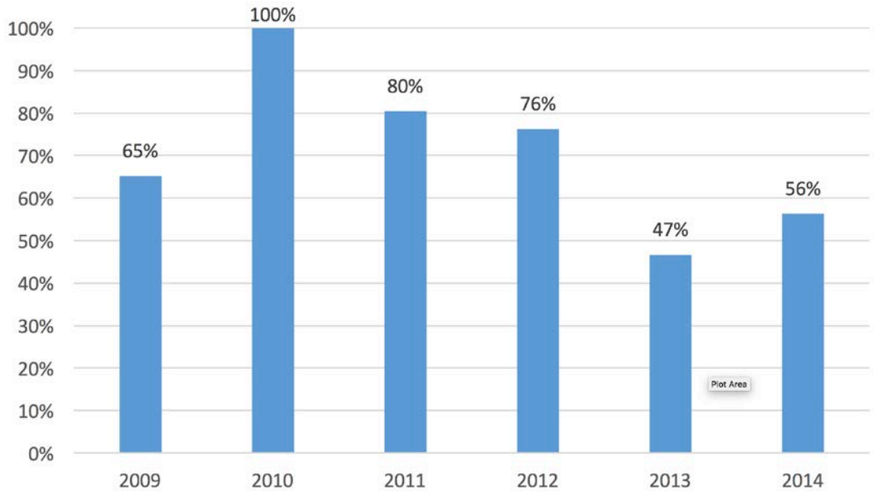
FIGURE 22 // DEVELOPMENT OF (U)EEE IMPORTS INTO NIGERIA (REFERENCE YEAR 2010)



Source: COMTRADE database (https://comtrade.un.org/)

Figure 23 shows the development of non-rail vehicle imports into Nigeria for the years 2009 to 2014 as percentages of import values based on USD in 2010, which was the year with the highest import volumes (around 12 billion USD). The data are based on the COMTRADE database and do not differentiate used and new vehicles.

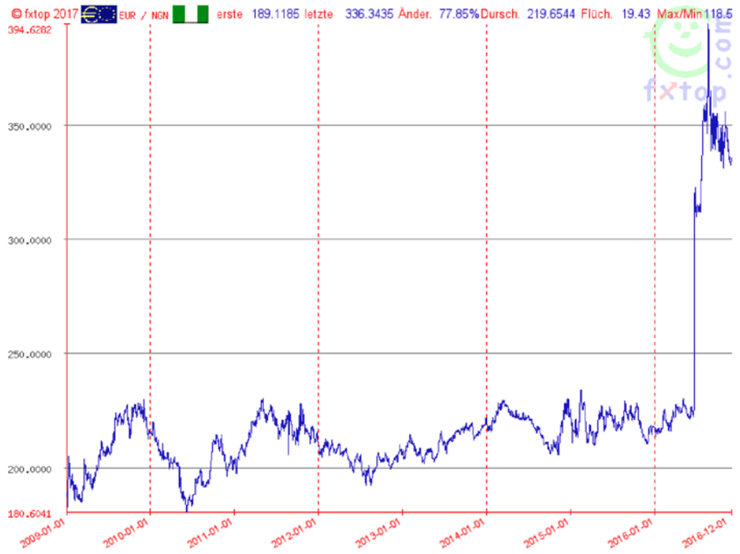
FIGURE 23 // IMPORTS OF NON-RAIL VEHICLES INTO NIGERIA (IN MIO USD)



Source: COMTRADE database, vehicles other than railway or tramway rolling stock)

Figure 24 shows the development of the Euro-Naira exchange rate from January 2009 to December 2016.

FIGURE 24 // HISTORICAL EURO-NAIRA EXCHANGE RATES FROM JANUARY 2009 TO DECEMBER 2016



Source: http://fxtop.com/de/

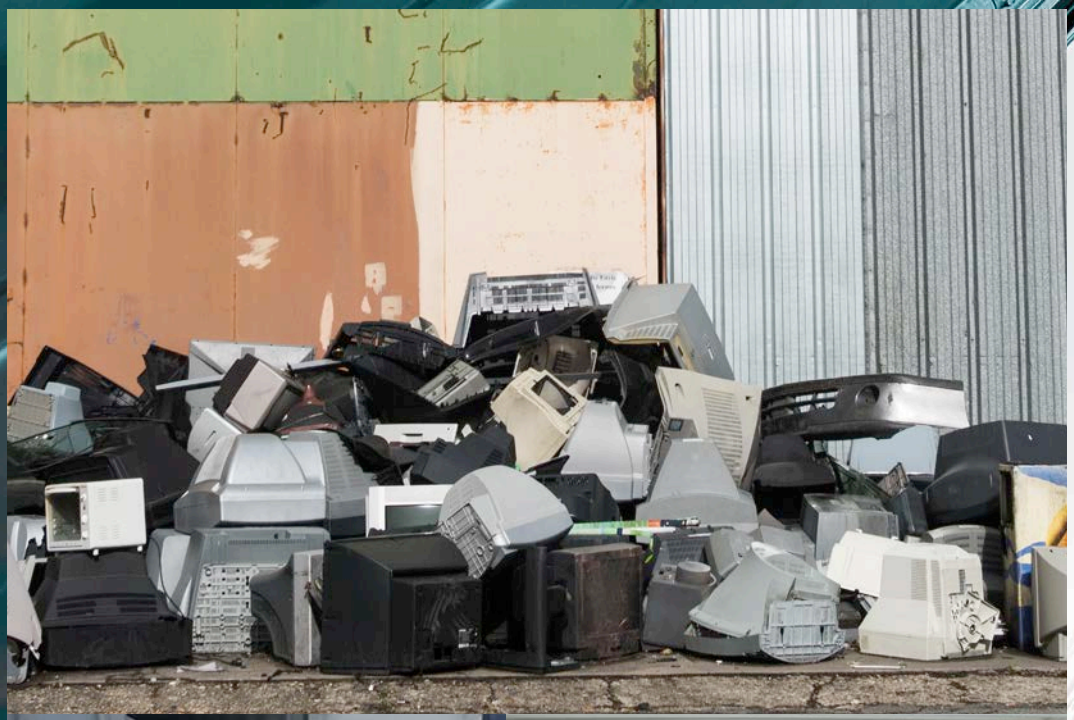
TABLE 30 // CONTAINER TRAFFIC IN NIGERIAN PORTS (T.E.U.: TWENTY-FOOT EQUIVALENT UNIT)

CONTAINER TRAFFIC STATISTICS AT NIGERIAN PORTS: 2007 – SEPTEMBER 2016								
Year	**INWARD**				**OUTWARD**			
	No of empties	Laden		T.E.U.	No of empties	Laden		T.E.U.
		No.	Tonn.			No.	Tonn.	
2007	979	407,828	2,697,353	356,551	382,481	247,076	298,627	75,399
2008	2,844	400,119	7,794,894	551,682	286,897	47,197	685,248	61,300
2009	177	416,351	5,802,550	577,267	376,276	57,830	897,994	76,317
2010	738	430,923	7,534,972	603,479	337,308	66,289	1,224,443	82,458
2011	97	536,719	9,252,781	753,411	435,134	66,202	1,239,600	86,566
2012	273	556,900	4,298,373	783,279	496,237	72,774	662,815	97,318
2013	437	623,409	10,729,910	887,211	503,225	79,718	1,435,972	105,455
2014	106	649,514	5,428,846	935,309	522,942	102,081	750,620	128,177
2015	126	534,223	9,419,672	771,130	417,627	128,687	2,263,594	168,249
*** Jan – Sept 2016**	3	333,535	6,831,348	485,262	247,799	85,225	1,485,338	491,197

Source: http://nigerianports.gov.ng/wp-content/uploads/2017/01/ContainerTrafficStat.pdf

FIGURE 25 // GROWTH RATE OF THE NIGERIAN GROSS DOMESTIC PRODUCT FROM 2008 TO END OF 2016

Source: https://tradingeconomics.com/nigeria/gdp-growth-annual



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