



PROJECT N. 037033

EXIOPOL

A NEW ENVIRONMENTAL ACCOUNTING
FRAMEWORK USING EXTERNALITY
DATA AND INPUT-OUTPUT TOOLS
FOR POLICY ANALYSIS

TEST ON TRANSFORMATION AND
EXPANSION OF TWO EU AND ONE OF
THE ROW COUNTRIES FOR THE
TRADE-LINKED THREE COUNTRY
PILOT

Report of the EXIOPOL project

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Executive Summary

Overview

EXIOPOL is a project funded by the European Commission under the 6th framework programme, priority 6.3 Global Change and Ecosystems. The consortium comprises a large number of partners and covers a variety of relevant research expertise in the field of environmental valuation and Environmentally Extended Input-Output assessment. Overall 38 universities and centres of research from Europe, China and India are involved. The project began in March 2007 and will last up to March 2011.

The research objectives of EXIOPOL are structured along two main pillars that converge in a third targeted to the use in EU policy assessment:

Pillar I: to synthesise and develop further estimates of the external costs of key environmental impacts for Europe;

Pillar II: to set up an environmentally extended (EE) Input-output (IO) framework in which as many of these estimates as possible are included, allowing the estimation of environmental impacts and external costs of different economic sector activities, final consumption activities and resource consumption for countries in the EU;

Pillar III: to apply the results of the external cost estimates and EEIO analysis for the analysis of policy questions of importance, as well as for the evaluation of the value and impact of past research on external costs on policy-making in the EU.

The EXIOPOL Project runs between March 2007 and 2011. The main project set-up is in three content clusters, one on externalities modelling (Cluster II), one on a Supply and Use/Input-Output (SUT/IO) accounting framework with environmental extensions (Cluster III), and one on using the combined result in modelling for decision support (Cluster IV).

Further information on EXIOPOL is available on the website of the project coordinator Fondazione Eni Enrico Mattei (FEEM), where the intermediate deliverables of the project are also available for download. This report describes work in Cluster III, focusing on setting up the harmonized SUT/IO dataset. The content of this report is based on our experience with four test countries: The Netherlands, Norway, China and the United States and with establishing a common method for transformation of national datasets to the EXIOPOL harmonized multi-regional dataset.

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1 Introduction

The goal of EXIOPOL Cluster III is the creation of a transparent, harmonized, environmentally-extended, global, multi-regional, input-output database for use in analysis relevant to European Union policy. It has been decided that this database will contain the 27 EU member states as well as 16 'Rest of the World' (RoW) countries¹. Each country's economy is represented by 129 industrial/product sectors as well as 9 subcategories of value added and 5 categories of final demand. In addition, the database contains environmental extensions consisting of 16 agricultural products (FAO); 7 forestry, fishing and cattle products (FAO); 9 metal categories (British Geological Survey, USGS), 9 non-metallic minerals (British Geological Survey); 6 fossil fuels (IEA); 122 energy product categories (IEA); as well as chemical releases 45 to air, 3 to water, and 8 to soil (Eurostat) (Peters, Manshanden et al. 2007). While other environmentally-extended MRIO models exist, once complete, EXIOPOL will offer the greatest degree of sectoral detail as well as the highest standards of transparency through the process of transforming the data from publically-available datasets to the database values (Tukker and Heijungs 2007). EXIOPOL will also be the first, environmentally-extended, global, MRIO model available as supply and use tables. This format allows for improved representation of the relationships between environmental-extensions, industries, consumption, and products. It also allows the user flexibility in technology assumption and product versus industry basis for their IO model.

The 16 RoW countries included in the project are selected on the basis of contribution to non-EU global GDP, trade with the EU and the amount of pollution embodied in trade. Together, the 16 selected RoW countries cover 92% of non-EU global GDP and over 80% of trade with the EU (Peters et al. 2007). Trade with and economic activity of all other RoW countries will be modeled as 'true Rest of the World' to make the interindustry portion of the model a closed system. These data have to become part of a harmonized environmentally extended Input-Output database that can support environmental and economic policy making.

Since the required data comes from a variety of sources, it is necessary to harmonize the economic data into a consistent format and structure. While most European countries publish Supply and Use tables in accordance with the Eurostat standard, other countries may publish only Input-Output tables or, as the example of the USA shows, Supply and Use tables in a different standard. In these cases, we need to transform available tables into a standard format so that they can be used together to produce consistent results. While doing this, our main goal is to stay as close as possible to official statistics published by each country's National Statistical Institute (NSI). In this paper we will discuss the methods available for transforming the tables in the EXIOPOL model and our experience in producing standard Supply and Use tables from Input-Output or non-standard Supply and Use tables for the U.S., China, Norway and The Netherlands.

¹ Rest of the World countries included in EXIOPOL are: USA, Japan, China, Canada, South Korea, Brazil, India, Mexico, Russia, Australia, Switzerland, Turkey, Taiwan, Norway, Indonesia and South Africa.

2 EXIOPOL structure

In EXIOPOL we will use supply and use tables according to Eurostat's ESA95 accounting format. As is shown in the two tables below, the orientation of both the supply and use table is products by industries. In principle, when European countries have supply and use tables available they comply with this standard. This is, however, not the case for all RoW countries. Here, a transformation from each country's basic tables into the format is needed. The required transformation steps will be explained in more detail in the next chapter.

Table 1: Supply table

	Industries	Imports (c.i.f)	Total	Valuation	Total
Products	Production matrix: Output by products and industries	Imports broken down by products	Supply of products at basic prices	Valuation adjustment items by product: + Taxes less subsidies on products +Trade and transport margins	Supply at purchasers' prices
Total	Output by industry at basic prices	Total Imports	Total supply at basic prices		Total supply

Table 2: Use table

Table 2: Use table						
	Industries	Sub-total	Final use			Total
			Final consumption	Gross capital formation	Exports, f.o.b.	
Products	Intermediate consumption at purchaser's prices by product and industry		By households, NPISH, government	Gross fixed capital formation and changes in inventories	Intra- and extra EU	Use at purchasers' prices
Subtotal (1)	Total intermediate consumption by industry		Total final use by type			Total use
Compensation of employees	Components of value added by industry					
Other net taxes on production						
Consumption of fixed capital						

Operating surplus, net	
Subtotal (3)	Value added
Total (1)+(3)	Output by industry at basic prices

Product/Industry Sectors

The products and industries selected for inclusion in the EXIOPOL database are based on the 60 sector NACE/CPA revision 1.1 coding system. This list of sectors has been extended to provide more detail for products and industries of particular interest for environmental policy. Table 3 describes the sectors which have been extended in the EXIOPOL database.

Table 3a. Increased detail of 2-digit NACE/CPA sectors for EXIOPOL

Product sectors in bold are environmentally significant 2-digit CPA sectors for which more detailed product and industry sectors are included in the EXIOPOL dataset. Detailed EXIOPOL products are listed below each. Products are grouped by product type or common supply chain. A complete list of 2-digit NACE/CPA sectors is included in Appendix I.

Food and Agriculture Products

Agriculture, hunting & related services (01) <ul style="list-style-type: none"> • Paddy rice • Wheat • Cereal grains nec • Vegetables, fruit, nuts • Oil seeds • Sugar cane, sugar beet • Plant-based fibers • Crops nec • Cattle • Pigs • Poultry • Meat animals nec • Animal products nec • Raw milk • Wool, silk-worm cocoons 	Food products & beverages (15) <ul style="list-style-type: none"> • Products of meat cattle • Products of meat pigs • Products of meat poultry • Meat products nec • products of vegetable oils & fats • Dairy products • Processed rice • Sugar • Food products nec • Beverages • Fish products
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Metal Products

Metal ores (13) <ul style="list-style-type: none"> • Iron ores • Copper ores & concentrates • Nickel ores & concentrates • Aluminium ores & concentrates • Precious metal ores & concentrates • Lead, zinc & tin ores & concentrates • Other non-ferrous metal ores & concentrates 	Basic metals (27) <ul style="list-style-type: none"> • Basic iron & steel & of ferro-alloys & first products thereof • Precious metals • Aluminium & aluminium products • Lead, zinc & tin & products thereof • Copper products • Other non-ferrous metal products • Foundry work services
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Table 3b. Increased detail of 2-digit NACE/CPA sectors for EXIOPOL
(continued)

Non-Metallic/Non-Energy Mineral Products

Other mining & quarrying products (14) <ul style="list-style-type: none"> • Stone • Sand & clay • Chemical & fertilizer minerals, salt & other mining & quarrying products nec 	Other non-metallic mineral products (26) <ul style="list-style-type: none"> • Glass & glass products • Ceramic goods • Bricks, tiles & construction products, in baked clay • Cement, lime & plaster • Other non-metallic mineral products
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Energy Products

Crude petroleum & natural gas; services incidental to oil & gas extraction excluding surveying (11) <ul style="list-style-type: none"> • Crude petroleum & services related to crude oil extraction, excluding surveying • Natural gas & services related to natural gas extraction, excluding surveying • Other petroleum & gaseous materials Coke, refined petroleum products & nuclear fuels (23) <ul style="list-style-type: none"> • Coke oven products • Motor spirit (gasoline) • Kerosene, including kerosene type jet fuel • Gas oils • Fuel oils nec • Petroleum gases & other gaseous hydrocarbons, except natural gas • Other petroleum products • Nuclear fuel 	Electrical energy, gas, steam & hot water (40) <ul style="list-style-type: none"> • Electricity by coal • Electricity by gas • Electricity by nuclear • Electricity by hydro • Electricity by wind • Electricity nec, including biomass & waste • Transmission of electricity • Distribution & trade of electricity • Manufactured gas & distribution of gaseous fuels through mains • Steam & hot water supply Trade, maintenance & repair services of motor vehicles & motorcycles; retail sale of automotive fuel (50) <ul style="list-style-type: none"> • Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts & accessories • Retail trade services of motor fuel
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Transport

Land transport; transport via pipeline (60) <ul style="list-style-type: none"> • Railway transportation • Other land transportation • Transportation via pipelines 	Water transport (61) <ul style="list-style-type: none"> • Sea & coastal water transportation • Inland water transportation
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Table 3c. Increased detail of 2-digit NACE/CPA sectors for EXIOPOL (continued)

Waste Collection, Waste Disposal, & Secondary Materials

Secondary raw materials (37)	Sewage & refuse disposal services, sanitation & similar services (90)
<ul style="list-style-type: none"> • Metal secondary raw materials • Non-metal secondary raw materials 	<ul style="list-style-type: none"> • Collection & treatment services of sewage • Collection of waste • Incineration of waste • Landfill of waste • Sanitation, remediation & similar services

3 Data Sources

Data in the EXIOPOL project will, where possible, be obtained from official publications of National Statistical Institutes (NSIs). In order to provide a higher degree of transparency in our data than is available in other standardized multi regional input output (MRIO) datasets, we have chosen to transform original NSI data into the desired structure for EXIOPOL rather than use harmonized tables provided by the Organisation for Economic Co-operation and Development (OECD) or Global Trade Analysis Project (GTAP). While this implies that we must perform a number of data manipulations ourselves, the advantage is that through clearly documenting our work we can keep the process as transparent as possible. In cases where there is no data available from NSIs, we have put preference on the OECD data. The original data the OECD used is obtained from Eurostat and NSIs. While the OECD does perform manipulations on the data, it is mainly to transform the data into a consistent and uniform dataset ready for modelling (Yamano and Ahmad 2006). For this reason, OECD data is still close to the original data.

With data from Eurostat for most European countries included in the project, NSI data for some European countries, and RoW countries and OECD data for all other countries, there is a match between country selection in EXIOPOL and data availability in terms of Supply and Use tables (SUT) or Input-Output tables (IOT). Therefore, the main challenge will be transforming and harmonizing the data for every country.

4 Method

In EXIOPOL the decision has been made to use SUTs as basic building blocks for the database. One of the reasons for this decision is that this creates flexibility for the users of the actual EXIOPOL database in the future. Using SUTs as basis for building up an IO framework accommodates both linkages of environmental extensions and final demand to products as well as industries. Usually environmental extensions need to be linked to industries, where final demand and trade need to be linked to products. IOTs are either product-by-product or industry-by-industry orientated. Starting with a SUT framework therefore creates the flexibility for end users to choose their own assumptions and create an IOTs that suits their own research best. Since EXIOPOL wants to stay as close as possible to official statistical sources, SUT also form the best basis for building an IO framework from this perspective. During the construction of SUTs no assumptions are needed, while the

construction of an IOT requires technology assumptions to generate a product-by-product or industry-by-industry core out of a product by industry orientated supply and use framework.

There are several caveats to use SUTs as basic building blocks for the IO database, though. Usually the Supply table is published in basic prices, and the Use table in purchasers' prices. In order to produce an IOT, both tables need to be in the same valuation. For this reason, valuation matrices giving taxes less subsidies and trade- and transport margins are needed to convert the use table from purchasers' prices into basic prices. In terms of workload this implies more effort on aligning the basic tables than if IOTs would have been used directly. On the other hand, not all countries publish IOTs in the same format. While some tables are given in a product-by-product format and others in an industry-by-industry format, also here transformations would be needed. Once the basic SUTs are in the right prices, transformations to the desired IOT via one of the common technology assumptions (i.e. industry technology, commodity technology, fixed industry sales structure, or fixed product sales structure assumption) are straightforward.

Since not all countries publish SUTs, sometimes crude assumptions have to be made to split a published IOT into a SUT. In general, the decision to use SUTs as starting point for the creation of the EXIOPOL database implies that different transformations of the basic tables are needed, dependent on the way NSIs publish their tables. Broadly speaking, all transformation steps needed for EXIOPOL can be divided in three parts:

- a) Transformations to complete the database.
- b) Transformations to detail (disaggregate) environmentally important sectors.
- c) Transformations to harmonize the tables into a common classification, currency and base year.

All transformation steps, together with the assumptions needed, will be explained in more detail in the next sections.

4.1 Completing the database

4.1.1 Creation of Supply and Use tables

Ideally all countries would publish SUTs in basic prices which could be incorporated in a standardized database by only bridging between sector classifications. Unfortunately this is the exception rather than the rule. Many EU countries and Norway provide a supply table in basic prices, a use table in purchasers' prices, as well as symmetric input-output tables (SIOTs) in basic prices for imports and domestic products to the European statistical agency (Eurostat) in a standardized 59 sector format. Data for other non-EU countries is often only available in the form of SIOTs. In addition to basic price SUTs, the trade-linking of countries in the EXIOPOL model can be done most accurately by incorporating information from tables containing total use in purchasers' prices, use of domestic products in basic prices, use of imported products in basic prices, trade and transport margins on the use table, taxes less subsidies on the use table, as well as individual tables containing supply of products for domestic use and export. Clearly not all of this information is available for countries in the EXIOPOL model. For example we do not know of any country which distinguishes between supply for domestic vs. export use. Depending on the data available various transformations must be made to estimate the desired dataset. A general principle we have followed in creating the EXIOPOL dataset has been to estimate the SUTs by first using the available data from NSI or Eurostat in the case of EU countries. SUTs are first created in the data's original sector system before aggregating and disaggregating to the EXIOPOL sectors. Here we will describe various levels of 'missing' information and the approaches to estimating the basic price SUT.

In the best cases, detailed tables of Supply, Use in basic prices, trade and transport margins, taxes less subsidies, and use in purchaser prices are all available. In the EU; Denmark, Belgium, and Finland provide all of these tables. In addition Spain also provides use in basic prices broken into use of domestic vs. imported products. For Spain however the trade and transport margins and taxes less subsidies are not distinguished. In cases where use tables in basic prices are not readily available we are left with a number of options. Rueda-Cantuche et al. (2007) have laid the groundwork for the creation of harmonized tables based on the Eurostat ESA 95 dataset.

The simplest option is to use the shares of trade and transport margins and taxes less subsidies from another similar country to estimate those of the country of interest. Benefits of this option are that it will always produce a reasonable table and that it is simple to implement. Drawbacks are that trade and transport margins as well as taxes less subsidies may vary widely across countries, and the countries for which we have information may not be similar to the country of interest. In the case of transportation, Denmark, Belgium and Finland each have their own particularities. Denmark consists of many islands which complicates transportation logistics and is expected to increase costs. Belgium is relatively densely populated and centrally located within Europe which suggests shipping costs may be comparatively low. Finland is sparsely populated and not centrally located which suggests more shipping would be done by truck and at a higher cost. In the case of taxes and subsidies it is also difficult to determine similarities between countries. For example, while Denmark and Finland might be considered to share similar tax and subsidy policy with other Scandinavian countries such as Norway and Sweden, consistency between government policy and the resulting incentives are in no way guaranteed. Once again as a small country, it is difficult to determine the generalizability of Belgium's taxes and subsidies. As many of their products are imported, information about taxes and subsidies for these industries are not present. Finally, the estimation of the use table in basic prices in this way does not allow for the recalculation of the SIOT that matches the original provided by Eurostat or the NSI.

A second option for estimating basic price tables in cases where a supply table in basic prices is provided is to reverse engineer the use table from the SIOT. Even better in the case of many EU countries, SIOTs for domestic and imported products are provided separately so they could be used to reverse engineer a Use table of domestic products and a Use table of imported products both in basic prices. By reverse engineering here we mean solving the equation used to determine the IOT for the Use table. This statement should be qualified by another. In our experience it is not possible to reverse engineer the basic price Use tables provided to Eurostat by Belgium, Denmark, and Finland from the IOTs. This test was performed and it was found that for the simplest technology assumptions, product-based technology or fixed industry/product sales structure, the reverse engineered basic price Use tables differed from those provided to Eurostat. We see a number of possible reasons for this. First, NSIs work with less aggregated data than those provided to Eurostat. Second, if a commodity-technology assumption is used by the NSI, adjustments may be made to the IOTs to correct for negative values resulting from the inversion of the normalized supply table. Third, it is possible that a method or assumption other than the two simplest assumptions was used, for example a mixed-technology assumption. For these reasons we have concluded that it is not practical to directly reverse engineer the Use in basic prices from the symmetric IO tables using a standard technology assumption.

However, several options for reverse engineering remain. One possibility is to perform the reverse engineering using the most likely standard technology assumption, commodity-technology, in the case of countries which present product-by-product IOTs, and the fixed product sales structure in the case of countries which present industry-by-industry tables. Under this approach we would perform a test to determine whether the results given in the reverse engineered table were reasonable. We check whether the values in the reverse engineered table are in agreement with the purchaser price use table. For example, in cases

where one table contains a zero and the other a number we make a substitution. More specifically, in the case where the use table in basic prices has a zero and the use table in purchaser prices has a value, we could substitute the value obtained using an adjustment based on the difference between the basic and purchaser price use table for Belgium, Denmark, or Finland for which data are available. When the industry technology or fixed product sales structure are used to reverse engineer it is possible that the resulting basic price use table contains negatives where the IO table did not. When these negative values are small they could also be replaced using the shares from Belgium, Denmark, or Finland. To restore agreement between the altered table and the total product and industry outputs obtained from the supply table we would then perform a RAS (Stone 1961; Stone and Brown 1962; Bacharach 1970) or similar procedure (Junius and Oosterhaven 2003; Jackson and Murray 2004; Oosterhaven 2005; Lenzen, Wood et al. 2007).

Another option is a more sophisticated optimization procedure which utilizes all of the available data to solve for the most probable basic price Use table. Data are available from Eurostat for a number of EU countries which would be useful for this purpose. These include the purchasers' price Use table, basic price Supply table, SIOTs, and column vectors containing totals for imports, trade and transport margins, and taxes less subsidies. While this method is promising, it is more complicated and less developed than the other methods considered. The benefit of this method is that it is able to take all information into account and create a basic price use table which can be used to reproduce the original SIOT under a simple technology assumption. The drawback is that the effects of changes in the control totals and input data on the results are not as well understood as in the other options. There is some loss of transparency which occurs owing to the more complicated nature of the optimization procedure; however it is considered that this is not a sufficient reason to discard this method. However, in the end more work is needed before this method could be used for the estimation of basic price Use tables.

One particular method that we used for producing consistent data by eliminating the error terms present in some national input-output tables (such as Taiwan and China) is the cross entropy approach. It represents a considerable extension and generalization of the standard RAS method, which assumes that one starts from a consistent prior SAM and has knowledge only about new row and column totals. The cross entropy framework allows a wide range of prior information to be used efficiently in estimation. Drawing on information theory, the cross-entropy approach is efficient in using all available information.

Taiwan input-output table (2001) has one undistributed row and one undistributed column in the intermediate block due to measurement errors. RAS method could not be directly used there since the column and row totals for intermediate output were not equal so we resorted to the minimal cross entropy method. Following Robinson (2001), we set up a minimization problem that preserves to the maximum extent possible the structure of the direct input coefficients of the intermediate bloc. The optimization problems then can be expressed as:

$$\text{Min} \left[\sum_i \sum_j a_{i,j} \ln \frac{a_{i,j}}{\bar{a}_{i,j}} \right]$$

Subject to:

$$\sum_j a_{i,j} y_j^* = y_i^*$$

$$\sum_j a_{i,j} = 1 \text{ and } 0 \leq a_{i,j} \leq 1$$

y^* is the final demand in the input-output table.

The objective function is the entropy distance between the prior (\bar{A}) and the new estimated coefficient matrix (A). This problem is equivalent to the following problem:

$$\text{Min} \left[\sum_i \sum_j X_{i,j} \ln \frac{X_{i,j}}{\bar{X}_{i,j}} \right]$$

Subject to:

$$\sum_{i,j} X_{i,j} = \sum_{i,j} \bar{X}_{i,j} \quad ,$$

where $\sum_{i,j} \bar{X}_{i,j}$ is the row total or the column total of the intermediate inputs including the undistributed row and undistributed column. The method yielded much better results in terms of the minimal alteration of the table structure as compared to a two-step procedure, which includes the proportional distribution of either error column or vector and then using RAS.

Yet another method for estimating the basic price Use table is to use the product-technology assumption to reverse engineer from product-by-product SIOTs and the fixed industry sales structure to reverse engineer from industry-by-industry SIOTs. The drawback of this method is that the Use table produced is not necessarily reflective of the actual Use table used by the NSI to create the SIOT. This method is desirable because it is simple, allows the user to reproduce the original table by calculating the table using the appropriate simple technology assumption, and it never creates negative values in the use table where they do not already exist in the IOT. In addition, this method incorporates the additional information provided by the SIOT for imports in the Use table for imports.

In the case of many non-European countries neither the Supply table nor the Use table in any valuation are available. In these cases only the total IOT or in some cases the domestic and import IOT are available. Estimating a Supply table in these cases would require a large amount of data, many assumptions, and many person-hours. In these cases we have chosen pragmatically to assume that the Supply table has entries only on the diagonal. All non-diagonal elements are zero. This corresponds to the one industry - one product assumption, under which the sectors produce only the primary output and no secondary outputs. In this case the Use table is equal to the SIOT.

However, the China case has shown that the one industry-one product assumption is unrealistic. China offers only a detailed IOT, which is in fact a semi finished sector by sector Supply table with a real error column. Here the one industry-one product assumption holds for exports, but not for imports. This became clear in the energy sector given in the detailed in the EXIOPOL format. Imports of crude oil to China appeared to be negligible. Close scrutiny showed that this was caused by the one sector-one product assumption. For example, the airline industry is producing and exporting airline services, but is importing aeroplanes and fuel, and not airline services. The one sector-one product assumption in this case results in imports of airplanes but neglects the imports of fuel. Only the refinery sector in China imports oil in this case. In those instances, total imports will be derived from the trade statistics which will be scaled to the level of the total imports value of the original IOT of China. The total import of all goods and services will then be correct.

An issue that will occur for almost every RoW country concerns the classification system in which IOTs or SUTs are compiled. In EXIOPOL the NACE/CPA rev 1.1 classification is the base coding system within which some sectors are expanded in non-standard ways specific to the requirements of environmentally-extended input-output analysis. All RoW tables are published in their own classification system. This implies that we have to structure the classification used in each RoW according with the NACE rev 1.1 classification. Where possible, we will use official correspondence tables published on the United Nations statistics website or by Eurostat. For countries where there is no such correspondence table available, we will have to create such ourselves. With help of country specific information of classification system this can be done quite easily in most cases. In cases where very detailed tables are available as primary source this is mostly a matter of aggregation. However, in some cases this reclassification is not this straightforward. In such case we have to manually assign products or sectors to the CPA or NACE classification. From a transparency point of view, it is important that we document all classification transformations well. The same applies to price adjustments of imports and exports (cif/fob adjustments) and all other country specific transformations which are sometimes needed.

4.1.2 Estimating valuation matrices

In general we find IO data in three valuations: Purchasers' price, producers' price, and basic price. To prevent distortions resulting from differences in taxes and subsidies, and to assign trade and transport margins to those sectors, it is preferable to create a MRIO in basic prices. However, from the perspective of a data collector it is easiest to ask a company to report the cost of their purchases (purchasers' price) and the value of their products (producers' price). The relationship between these valuations is as follows: The purchasers' price of a good or service is the total cost paid by the consumer. The producers' price is the purchasers' price less the margins associated with retail trade, warehousing, transportation, etc. The basic price is the producers' price less taxes and with subsidies added. Because trade-linking of the national datasets is a key feature of any MRIO dataset, it is important to maintain consistency between the pricing of trade and that of the national tables. To do this it is desirable to have valuation matrices which can be added or subtracted to for example compute the purchasers' price use table from the basic price use table. Under the ESA95 standards, use tables would be provided with accompanying table of trade and transport margins as well as taxes less subsidies for each transaction.

As described earlier, for some European countries their supply table is available together with an IO table in basic prices. In these cases it is possible to reverse engineer a use table in basic prices as we have described in a previous section. If a purchasers' price use table is also provided, it is possible to estimate the sum of the trade and transport margins and the taxes less subsidies by subtracting the basic price use table from the purchasers' price use table. As previously discussed, amongst European countries, only Belgium, Denmark, and Finland publish matrices of trade and transport margins and taxes less subsidies. For other countries, if there is any auxiliary information available from NSIs this will be used to estimate a distribution of the taxes less subsidies and trade and transport margins vectors from the Supply table. In cases where there is no useful NSI data available to estimate such distribution, an option would be to use the structure of valuation matrices from countries that do publish them. However, we will only apply this methodology if the production structure of the 'donor' country is a fairly good match. In remaining cases we apply a proportionate distribution of the taxes less subsidies and trade and transport margins vectors if they are available. If even these are not available we will estimate the trade and transport margins and taxes less subsidies from the values used in other EXIOPOL tables.

4.1.3 Estimating Import and Export matrices

Once we have both the Supply and Use table available in basic prices the next step to complete the database is to present these tables in two parts. Use tables will be presented in a part that shows the use of domestically produced goods and services, and a part that shows the use of imported goods and services. In some cases domestic and import IO or Use tables are available. For countries where this is the case these data will be used to split the Use table into the use of domestically produced goods and services and the use of imports, both in basic prices. For countries where there is no such information available from NSIs, the use of imported goods and services will be estimated by assuming a proportionate distribution of the imports vector from the Supply table. By simply subtracting the estimated use of imports from the Use table in basic prices, the use of domestically produced goods and services is given.

Another issue is the treatment of imports in IOTs. In the IOT, imports used for intermediate consumption are accounted for in the intermediate block while imports used for final consumption are accounted for in the final consumption block. In the Supply table, all imports are represented by a single column outside of the production block. To create individual Use tables for domestic and imported products we must remove imports used for intermediate consumption from the intermediate block of the IOT. Here, again, we have to make an assumption about the distribution of imports used for intermediate consumption over the sectors. When no additional information is available for estimating the import use table (U_{imp}), we are left with few options. In these cases we have chosen to allocate imports (m) across rows of the total use table (U_{tot}) according to shares of supply ($q+m$) consumed at each product-industry intersection. This is done with one caveat. Re-exports ($m_{re-export}$) are estimated separately as it is unlikely that such a high portion of exports (e) are actually re-exported imports. Thus we must use the fraction of exports which are re-exported imports from a similar economy for which data are available. The final allocation procedure can be represented as follows:

$$U_{imp} = [U_{tot}^T (\hat{q} + \hat{m} - \hat{e})^{-1} (\hat{m} - \hat{m}_{re-export})]^T \quad (1)$$

Similarly, the trade-linking of the national tables would benefit from the provision of separate supply tables for domestically-consumed and exported goods and services. As we are not aware of any country which publishes a separate supply table for exports and as it is reasonable to assume that the production structure in terms of primary and secondary products does not differ much between domestically consumed products and exports, this split will be undertaken by assuming a proportionate distribution of domestically produced exports ($e - e_{re-export}$) across the supply table (S_{tot}). This procedure can be represented as follows:

$$S_{exp} = [S_{tot}^T \hat{q}^{-1} (\hat{e} - \hat{e}_{re-export})]^T \quad (2)$$

Where q is the total commodity output, S_{tot} is the total supply table, S_{exp} is the export supply table, e is the column vector of total exports, and $e_{re-export}$ is the column vector of imports which are re-exported. The difference between total exports and re-exported imports is the export value found in the use table for domestic products.

4.2 Harmonizing the database across countries

4.2.1 Common base year

The year 2000 was chosen as base year for the EXIOPOL database. When data are only available for other years, values must be scaled up or down to the appropriate base year for

comparability across countries and to ensure agreement with the year 2000 trade flows. Macro-economic statistics such as GDP, imports, value added, and final demand in the national currency and in current prices, published by national statistical offices are used to transform the tables across years. With these official macro-economic statistics we can estimate supply and use tables for the year 2000. However, as the mix of industry and product output changes across years, scaling results in unbalanced tables or tables where the estimated row or column totals do not match available data. To correct for problems caused by scaling IO data across years it is common to use a RAS procedure, although recent discussion has drawn attention to the choice of matrix updating procedures. Other choices include the GRAS and sign-preserving absolute differences (SPAD) among others.

4.2.2 Currency exchange rates

To allow for rebalancing the national IO tables after trade-linking, it is necessary to provide all values in a common currency. The Euro has been chosen for this purpose in the EXIOPOL database. In order to maintain the highest degree of transparency and country tables will also be provided in their national currency with the currency conversion being performed as the final step before incorporation in the trade-linked model. The current plan is to use the annual average exchange rates provided by International Monetary Fund in their International Financial Statistics for this purpose. However, in a recent conversation with Peter Ritzmann (Eurostat) informed us that Eurostat is recommending exchange rates at the time of Euro adoption be used by European countries to convert their supply, use, and input-output tables to Euros (Ritzmann 2008). The reason for this is to correct for distortions resulting from differences in pre-Euro monetary policies.

4.3 Detailing the datasets

To provide the environmental detail desired in the EXIOPOL model and to maintain consistency across nations included in the dataset we have defined a standard set of 129 industry/product sectors. The sectoral structure of the EXIOPOL database loosely follows the NACE revision 1.1 industry classification or CPA product classification. All sectors present in the standardized Eurostat tables are also present in the EXIOPOL database. In addition, details have been added to sectors of particular importance to environmental-policy analysis. The following are categories of products for which additional details are provided in the EXIOPOL database:

- a) Agriculture and food
- b) Mining and raw materials
- c) Energy intensive metals production
- d) Electricity
- e) Transport
- f) Waste management

A complete overview of the products and sectors used in EXIOPOL is given in Appendix I.

In some cases the additional details required for EXIOPOL are provided directly in the national-level tables available from the NSI. For example, supply and use tables for the U.S. are available with nearly 500 sectors. In cases where the available data falls short of that required to complete the EXIOPOL structure auxiliary data and estimation procedures must be used to create the desired level of detail. Estimation of this additional data must be done using appropriate, consistent data, in a way that can be easily understood by the model user, and within a reasonable time frame. To meet these criteria we have established a hierarchy

of preference of data sources for use in disaggregating the data. In the case of EU member states and Norway, data are available in the NACE revision 1.1 structure with 59 sectors. In these cases, these data are considered to have priority. In other words, if the EXIOPOL dataset were re-aggregated to the NACE revision 1.1, 2-digit level of detail, it would exactly match the data provided to Eurostat. Such standardized datasets are also available from the OECD and in the GTAP database for a number of EU member states as well as some non-EU member states. However, the tables available from these sources have undergone more transformation in order to standardize them with other countries in the database. In the case of the OECD the level of detail is less than that available from Eurostat. Since the conception of the EXIOPOL project GTAP has extended their level of detail to 86 sectors with most of the additional details related to agriculture. However, the structure of the national tables contained in GTAP is often based on older IO tables, some from as early as the 1970s. In addition, as tables are often provided to GTAP on a single country basis by users of the model, the data transformations are often unclear and not well documented. Further, to balance the GTAP database a number of balancing procedures are used which further distort the data. In order to provide the greatest clarity and most updated data available we place preference on Eurostat data when it is available.

Another important source of information is that directly available from NSI. All other MRIO databases are derived from these data. In the case of non-EU member states and when data are not available from Eurostat this information is given first priority. In the case of some EU member states data from their NSI are available at a greater level of detail than provided by Eurostat. In these cases the Eurostat data are given priority and the data from the NSI is used to disaggregate the Eurostat data according to the shares of the disaggregated total. The reason for this is that having to data updates, differences in techniques, and even potentially differences between the sections of the NSI compiling the data, data available directly from Eurostat may not match exactly those the NSI has provided. As a result, some judgement is required. We perform a check where NSI data are aggregated to the NACE rev. 1.1 details and compared to the Eurostat data. If these data match within a reasonable degree, that is if they have the same sign and differ by less than 20%, we disaggregate data provided by Eurostat directly using data provided by NSI. Of course for non-EU member states and in cases where data are not provided to Eurostat, NSI data are used directly.

Unfortunately the desired level of detail cannot be obtained from NSI IO data alone. A number of topical datasets exist which are used to provide further detail including those provided by the International Energy Agency (IAE), the British Geological Survey, the US Geological Survey, and the United Nations Food and Agriculture Organisation (FAO). In some cases these data are already being collected for inclusion in the EXIOPOL dataset as satellite accounts given in non-monetary units or physical flows such as kilowatt-hours or tonnes. In the case of EU-member states Eurostat also provides Annual Enterprise Statistics containing data similar to those contained in the IO tables but at a greater level of detail.

When using data in physical units to disaggregate the supply and use tables, estimated prices of the physical flows must be used to divide the monetary values. Ideally a sector would represent a single product with a unique price. In reality however, sectors represent a collection of similar, yet distinct products with differing prices. The overall price depends on the collection of goods included in the sector and the prices of each. When there is little variation in price the connection between physical and monetary flows can be made using a representative price. However, when prices vary it is necessary to know the prices of the most significant flows as well as the relative share of each. Trade data however provide an attractive alternative for estimating the representative price of a sector. When trade data are available in both physical and monetary, the average price of the import and export flows for a country can be calculated.

With use of the above mentioned data sources for auxiliary information to disaggregate the tables there remain, however, some difficulties in adding detail in the tables. Some cases remain where no data are directly available for the country of interest. In these cases we adopt the structure of a similar sector in the same country or of the matching sector in a similar country. For instance, NACE sector 50 (Sale, maintenance and repair of motor vehicles and fuel) is broken in two separate sectors in EXIOPOL, 'sale, maintenance and repair of motor vehicles' and 'sale of fuel'. Here, our solution is to assign an appropriate share of refinery output of motor fuel to 'sale of fuel' and allocate value added proportionally from the overarching NACE sector 'sale, maintenance and repair of motor vehicles and fuel'.

The general principles applied in disaggregating sectors for EXIOPOL are as follows:

- 1) Consistency across countries is achieved through the use of data sources such as Eurostat for EU member states and the International Energy Agency, UN Food and Agriculture Organization, and British Geological Survey which provide consistent data for a number of the countries included in the EXIOPOL database
- 2) Transparency is achieved through the use of publicly available data and data provided by national statistical institutes
- 3) Data provided in monetary values directly are preferable to those which must be converted using price information due to variation in prices within sectors
- 4) Data transformations performed within the NSI are preferred to those we would use to estimate a dataset while data transformations performed by other third-party institutes such as OECD or GTAP data providers are less-preferred in cases where they are less transparent than another available estimation option.

Following these principles the order of priority given to data sources in disaggregating sectors for EXIOPOL in practice is as follows:

- a) Supply, use, and input-output tables provided by Eurostat (for EU member states)
- b) Supply, use, and input-output tables provided directly by NSI
- c) More detailed data contained in datasets made publicly available by NSI
- d) Datapoints contained in the Annual Enterprise Statistics
- e) Agriculture social accounting matrix (SAMS) compiled by IPTS based on UN Food and Agriculture Organization data (also to be included in newest GTAP database)
- f) Energy and electricity supply, use, and generation mix provided by the International Energy Agency
- g) Metals and non-metal minerals extraction and production and monetary values provided by the British Geological Survey
- h) Metals and non-metal minerals extraction and production and monetary values provided by the US Geological Survey
- i) Metal price data provided by the London Metals Exchange, British Geological Survey, and US Geological Survey in that order

This order of preference is strictly followed except in cases where data is available from multiple providers and we find large discrepancies between the values. In these cases explanations of the reasons for deviating from the order of preference will be provided in a technical report accompanying the datasets.

5 Country-Specific Details

5.1 The Netherlands

The Netherlands publishes basic price supply and use tables containing 58 products and 105 industries. These data have been aggregated into the EXIOPOL sectors using a bridge matrix. The industry sectors can thus be used to add some detail to the 60-sector NACE/CPA data already available from Eurostat. However, in many cases the extra detail available in the Dutch tables relate to only one sector in EXIOPOL. In other cases a single sector in the Dutch tables relates to several sectors in EXIOPOL. For these reasons the amount of added detail we are able to obtain from the Dutch tables for EXIOPOL is limited.

5.2 Norway

Norway does not publish supply and use tables for the year 2000. SSB (the Norwegian Statistical Office) began publishing a basic price supply and purchaser's price use table in 2001. However, domestic and import IO tables in basic prices are available from Eurostat for the year 2000 and at the NACE revision 1.1 60-sector level of detail. In addition to these tables we have obtained from slightly more detailed domestic and import IO tables in basic prices for the year 2000 from SSB. The detail in addition to that available in the Norwegian IOT available from Eurostat maps directly to the EXIOPOL sectors and is presented in Table 4.

Table 4. Detail beyond 60-sector NACE rev. 1.1 obtained from the SSB (the Norwegian statistical office).

261	Manufacture of glass and glass products
269	Manufacture of other non-metallic mineral products
271	Manufacture of basic iron and steel
274	Manufacture of basic precious and non-ferrous metals
275	Casting of metals
401	Production and distribution of electricity
403	Steam and hot water supply
601	Transport via railways
602	Other land transport
603	Transport via pipelines
611	Sea and coastal water transport
619	Inland water transport

5.3 China

Source data

The primary data we have available for China is a symmetric 122 sector industry by industry IO table in Remnimb (Yuan) for the year 2002. We have received this detailed IO table from a contact within the US Bureau of International Trade.

Concordance table

Because the Chinese IO table is published in a Chinese industry classification a concordance table had to be constructed ourselves. The concordance list used to meet the EXIOPOL classification can be found in Appendix III. This concordance table makes clear that the 122 Chinese industries do not yet comply with the 129 EXIOPOL sectors. Further disaggregation is thus needed.

Special transformations

The Chinese IO table has an official discrepancy column. All IO tables published by the national bureau of statistics of China include such a discrepancy column. Also in the OECD IO table for China this discrepancy column is still visible. We therefore had to remove this column ourselves. The total value of the discrepancy column is small as a percentage of intermediate deliveries or gross output, however large in relation to other final demand categories. To solve this problem it is decided to leave intermediate consumption and other final demand transactions intact and subtract the discrepancy column from total output. By subtracting the discrepancy column from total output, the table is unbalanced so that also total input needed to be adjusted. This adjustment is done in value added. After this adjustment total output equals total input again. By this correction value added has changed with 1.4 percent.

5.4 United States

Source data

For the United States we have the 2002 Benchmark IO tables available from the US Bureau of Economic Analysis. The data includes 2002 Make (industry by commodity) and Use (industry by commodity) tables in producers' prices in US Dollars. Both tables include roughly 430 commodity/industry sectors. Furthermore, an import matrix and trade and transport margins tables are available. Using the margins tables transformations to purchasers' prices are possible.

Concordance table

The US benchmark IO table follows the NAICS 2002 classification system. In order to match the NACE revision 1.1 classification used in EXIOPOL we constructed a concordance table. Here it was possible to make use of official concordance tables published by Eurostat. The resulting concordance table can be found in Appendix IV of this report.

Special transformations

During the transformation process of the United States IO table it appeared that a few special transformation were needed. Because the primary IO tables were given in producers' prices we had to make a transformation into basic prices. For this information about taxes less subsidies were needed. In a normal supply and use table framework a taxes less subsidies vector is given in the basic price supply table. In the US case however this vector was absent. In the original producer priced make table, taxes less subsidies were included in every transaction. We therefore had to estimate a taxes less subsidies vector first, before we were able to transform the make table into basic prices. With auxiliary data about taxes and subsidies from the BEA, we estimated a distinction between taxes and subsidies related to

products and taxes and subsidies not related to products. These shares are applied to the taxes less subsidies row in value added block of the use table. We then assumed a diagonal distribution of taxes less subsidies related to products in the make table.

Another special treatment was needed for imports. Initially imports were given as negatives in the use table. Therefore we first had to remove this vector from the use table and add this (multiplied by minus 1) to the make table. The next step was to change the valuation of imports by commodity. Original imports by commodity were given in CIF prices plus import duties. Because a negative value for imports duties was also booked in the Wholesale sector, total imports represented the correct CIF value. To solve this we had to subtract estimated import duties from every commodity. Here we assumed a zero tariff for energy and natural resources and a proportional distribution of total import duties among all other commodities. Counter values for these corrections were placed in the taxes less subsidies column so that total supply was not changed. There also appeared to be some negative import values due to corrections by the BEA for Gold and international transport operated by domestic firms. The US import matrix gives us the exact amounts which were corrected so that we were able to add them to imports again. Counter bookings were made in the exports vector in the use table so that the system remained balanced.

A last special issue is the existence of the rows of Non-comparable imports and Rest of the World adjustments. Because no more information is available a proportionate distribution is used to remove these rows from the supply and use tables.

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Annex I: Appendixes

Appendix I: Survey of national sources for supply, use, and input-output data for European countries.

#	Country Name	National Statistical Office	Contact	Detailed Data (> 60 sectors) Available
1	Austria	Statistik Austria (Statistik Austria)	Erwin Kolleritsch	Yes
2	Belgium	Statistics Belgium (Statistics Belgium)		No
6	Denmark	Statistics Denmark (Denmark 2003)	Ole Gravgård Pedersen	Yes
7	Estonia		Marje Asper	-
9	France	Insitutet national de la statistique et des etudes économiques (INSEE)		Yes
10	Germany	Statistisches Bundesamt (Statistisches Bundesamt 2002)		Yes
16	Lithuania	Statistics Lithuania (Lithuania 2000-2001)	Aldona Lazareviciene	-
19	Netherlands	CBS (CBS 2000)		Yes
20	Norway	Statistics Norway (Norway 2000)		Yes
25	Slovenia	Statistical office of the Republic of Slovenia (SRS 2008)	Janja Kalin	-
26	Spain	National Statistics Institute (INE 2008)		Yes
27	Sweden	Statistics Sweden	Anna Skygge	-
28	United Kingdom	Office for National Statistics (UK Office for National Statistics 2000)	Sanjiv Mahajan	Yes

Appendix II: EXIOPOL commodity and industry classification

Table A1: : EXIOPOL sector classification (code and level correspond with NACE 1.1: a letter is used if an own sub-classification had to be used)

No	Code	Level	Description
1	01.a	4	Cultivation of Paddy rice
2	01.b	4	Cultivation of Wheat
3	01.c	4	Cultivation of Cereal grains nec
4	01.d	4	Cultivation of Vegetables, fruit, nuts
5	01.e	4	Cultivation of Oil seeds
6	01.f	4	Cultivation of Sugar cane, sugar beet
7	01.g	4	Cultivation of Plant-based fibers
8	01.h	4	Cultivation of Crops nec
9	01.i	4	Cattle farming
10	01.j	4	Pigs farming
11	01.k	4	Poultry farming
12	01.l	4	Meat animals nec
13	01.m	4	Animal products nec
14	01.n	4	Raw milk
15	01.o	4	Wool, silk-worm cocoons
16	2	3	Forestry, logging and related service activities
17	5	3	Fishing, fish farming and related service activities
18	10	3	Mining of coal and lignite; extraction of peat
19	11.a	4	Extraction of crude petroleum and services related to crude oil extraction, excluding surveying
20	11.b	4	Extraction of natural gas and services related to crude oil extraction, excluding surveying
21	11.c	4	Extraction / liquefaction / regasification of other petroleum and gaseous materials
22	12	3	Mining of uranium and thorium ores

23	13.10	5	Mining of iron ores
24	13.20.a	6	Mining of Copper ores and concentrates
25	13.20.b	6	Mining of Nickel ores and concentrates
26	13.20.c	6	Mining of Aluminium ores and concentrates
27	13.20.d	6	Mining of Precious metal ores and concentrates
28	13.20.e	6	Mining of Lead, zinc and tin ores and concentrates
29	13.20.f	6	Mining of Other non-ferrous metal ores and concentrates
30	14.1	4	Quarrying of stone
31	14.2	4	Quarrying of sand and clay
32	14.3	4	Mining of chemical and fertilizer minerals, production of salt, other mining and quarrying n.e.c.
33	15.a	4	processing of meat cattle
34	15.b	4	processing of meat pigs
35	15.c	4	processing of meat poultry
36	15.d	4	production of Meat products nec
37	15.e	4	processing Vegetable oils and fats
38	15.f	4	Processing of Dairy products
39	15.g	4	Processed rice
40	15.h	4	Sugar refining
41	15.i	4	Processing of Food products nec
42	15.j	4	Manufacture of beverages
43	15.k	4	Manufacture of fish products
44	16	3	Manufacture of tobacco products
45	17	3	Manufacture of textiles
46	18	3	Manufacture of wearing apparel; dressing and dyeing of fur
47	19	3	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
48	20	3	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

49	21	3	Manufacture of pulp, paper and paper products
50	22	3	Publishing, printing and reproduction of recorded media
51	23.10	5	Manufacture of coke oven products
52	23.20.a	6	Manufacture of motor spirit (gasoline)
53	23.20.b	6	Manufacture of kerosene, including kerosene type jet fuel
54	23.20.c	6	Manufacture of gas oils
55	23.20.d	6	Manufacture of fuel oils n.e.c.
56	23.20.e	6	Manufacture of petroleum gases and other gaseous hydrocarbons, except natural gas
57	23.20.f	6	Manufacture of other petroleum products
58	23.30	5	Processing of nuclear fuel
59	24	3	Manufacture of chemicals and chemical products
60	25	3	Manufacture of rubber and plastic products
61	26.a	4	Manufacture of glass and glass products
62	26.b	4	Manufacture of ceramic goods
63	26.c	4	Manufacture of bricks, tiles and construction products, in baked clay
64	26.d	4	Manufacture of cement, lime and plaster
65	26.e	4	Manufacture of other non-metallic mineral products n.e.c.
66	27.a	4	Manufacture of basic iron and steel and of ferro-alloys and first products thereof
67	27.b	4	Precious metals production
68	27.c	4	Aluminium production
69	27.d	4	Lead, zinc and tin production
70	27.e	4	Copper production
71	27.f	4	Other non-ferrous metal production
72	27.g	4	Casting of metals
73	28	3	Manufacture of fabricated metal products, except machinery and equipment
74	29	3	Manufacture of machinery and equipment n.e.c.

75	30	3	Manufacture of office machinery and computers
76	31	3	Manufacture of electrical machinery and apparatus n.e.c.
77	32	3	Manufacture of radio, television and communication equipment and apparatus
78	33	3	Manufacture of medical, precision and optical instruments, watches and clocks
79	34	3	Manufacture of motor vehicles, trailers and semi-trailers
80	35	3	Manufacture of other transport equipment
81	36	3	Manufacture of furniture; manufacturing n.e.c.
82	37.10	5	Recycling of metal waste and scrap
83	37.20	5	Recycling of non-metal waste and scrap
84	40.11.a	6	Production of electricity by coal
85	40.11.b	6	Production of electricity by gas
86	40.11.c	6	Production of electricity by nuclear
87	40.11.d	6	Production of electricity by hydro
88	40.11.e	6	Production of electricity by wind
89	40.11.f	6	Production of electricity nec (including biomass and waste)
90	40.12	5	Transmission of electricity
91	40.13	5	Distribution and trade of electricity
92	40.2	4	Manufacture of gas; distribution of gaseous fuels through mains
93	40.3	4	Steam and hot water supply
94	41	3	Collection, purification and distribution of water
95	45	3	Construction
96	50.a	4	Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessories
97	50.b	4	Retail sale of automotive fuel
98	51	3	Wholesale trade and commission trade, except of motor vehicles and motorcycles
99	52	3	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods

100	55	3	Hotels and restaurants
101	60.1	4	Transport via railways
102	60.2	4	Other land transport
103	60.3	4	Transport via pipelines
104	61.10	5	Sea and coastal water transport
105	61.20	5	Inland water transport
106	62	3	Air transport
107	63	3	Supporting and auxiliary transport activities; activities of travel agencies
108	64	3	Post and telecommunications
109	65	3	Financial intermediation, except insurance and pension funding
110	66	3	Insurance and pension funding, except compulsory social security
111	67	3	Activities auxiliary to financial intermediation
112	70	3	Real estate activities
113	71	3	Renting of machinery and equipment without operator and of personal and household goods
114	72	3	Computer and related activities
115	73	3	Research and development
116	74	3	Other business activities
117	75	3	Public administration and defence; compulsory social security
118	80	3	Education
119	85	3	Health and social work
120	90.01	5	Collection and treatment of sewage
121	90.02.a	6	collection of waste
122	90.02.b	6	Incineration of waste
123	90.02.c	6	Landfill of waste
124	90.03	5	Sanitation, remediation and similar activities
125	91	3	Activities of membership organizations n.e.c.
126	92	3	Recreational, cultural and sporting activities



Errore. L'origine riferimento non è stata trovata.

127	93	3	Other service activities
128	95	3	Activities of households as employers of domestic staff
129	99	3	Extra-territorial organizations and bodies

Table A2: EXIOPOL product classification (level and code correspond with CPA: a letter is used where an own sub-classification had to be used)

No	Code	Level	name
1	01.a	4	Paddy rice
2	01.b	4	Wheat
3	01.c	4	Cereal grains nec
4	01.d	4	Vegetables, fruit, nuts
5	01.e	4	Oil seeds
6	01.f	4	Sugar cane, sugar beet
7	01.g	4	Plant-based fibers
8	01.h	4	Crops nec
9	01.i	4	Cattle
10	01.j	4	Pigs
11	01.k	4	Poultry
12	01.l	4	Meat animals nec
13	01.m	4	Animal products nec
14	01.n	4	Raw milk
15	01.o	4	Wool, silk-worm cocoons
16	2	3	PRODUCTS OF FORESTRY, LOGGING AND RELATED SERVICES
17	5	3	FISH AND OTHER FISHING PRODUCTS; SERVICES INCIDENTAL TO FISHING
18	10	3	COAL AND LIGNITE; PEAT
19	11.a	4	crude petroleum and services related to crude oil extraction, excluding surveying
20	11.b	4	natural gas and services related to crude oil extraction, excluding surveying
21	11.c	4	other petroleum and gaseous materials
22	12	3	URANIUM AND THORIUM ORES
23	13.10	5	Iron ores

24	13.20.a	6	Copper ores and concentrates
25	13.20.b	6	Nickel ores and concentrates
26	13.20.c	6	Aluminium ores and concentrates
27	13.20.d	6	Precious metal ores and concentrates
28	13.20.e	6	Lead, zinc and tin ores and concentrates
29	13.20.f	6	Other non-ferrous metal ores and concentrates
30	14.1	4	Stone
31	14.2	4	Sand and clay
32	14.3	4	Chemical and fertilizer minerals, salt and other mining and quarrying products n.e.c.
33	15.a	4	products of meat cattle
34	15.b	4	products of meat pigs
35	15.c	4	products of meat poultry
36	15.d	4	Meat products nec
37	15.e	4	products of Vegetable oils and fats
38	15.f	4	Dairy products
39	15.g	4	Processed rice
40	15.h	4	Sugar
41	15.i	4	Food products nec
42	15.j	4	Beverages
43	15.k	4	Fish products
44	16	3	TOBACCO PRODUCTS
45	17	3	TEXTILES
46	18	3	WEARING APPAREL; FURS
47	19	3	LEATHER AND LEATHER PRODUCTS
48	20	3	WOOD AND PRODUCTS OF WOOD AND CORK (EXCEPT FURNITURE); ARTICLES OF STRAW AND PLAITING MATERIALS
49	21	3	PULP, PAPER AND PAPER PRODUCTS
50	22	3	PRINTED MATTER AND RECORDED MEDIA

51	23.10	5	Coke oven products
52	23.20.a	6	motor spirit (gasoline)
53	23.20.b	6	kerosene, including kerosene type jet fuel
54	23.20.c	6	gas oils
55	23.20.d	6	fuel oils n.e.c.
56	23.20.e	6	petroleum gases and other gaseous hydrocarbons, except natural gas
57	23.20.f	6	other petroleum products
58	23.30	5	Nuclear fuel
59	24	3	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
60	25	3	RUBBER AND PLASTIC PRODUCTS
61	26.a	4	Glass and glass products
62	26.b	4	Ceramic goods
63	26.c	4	Bricks, tiles and construction products, in baked clay
64	26.d	4	Cement, lime and plaster
65	26.e	4	Other non-metallic mineral products
66	27.a	4	basic iron and steel and of ferro-alloys and first products thereof
67	27.b	4	Precious metals
68	27.c	4	Aluminium and aluminium products
69	27.d	4	Lead, zinc and tin and products thereof
70	27.e	4	Copper products
71	27.f	4	Other non-ferrous metal products
72	27.g	4	Foundry work services
73	28	3	FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT
74	29	3	MACHINERY AND EQUIPMENT N.E.C.
75	30	3	OFFICE MACHINERY AND COMPUTERS
76	31	3	ELECTRICAL MACHINERY AND APPARATUS N.E.C.
77	32	3	RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS

78	33	3	MEDICAL, PRECISION AND OPTICAL INSTRUMENTS; WATCHES AND CLOCKS
79	34	3	MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS
80	35	3	OTHER TRANSPORT EQUIPMENT
81	36	3	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
82	37.10	5	Metal secondary raw materials
83	37.20	5	Non-metal secondary raw materials
84	40.11.a	6	Electricity by coal
85	40.11.b	6	Electricity by gas
86	40.11.c	6	Electricity by nuclear
87	40.11.d	6	Electricity by hydro
88	40.11.e	6	Electricity by wind
89	40.11.f	6	Electricity nec (including biomass and waste)
90	40.12	5	Transmission services of electricity
91	40.13	5	Distribution and trade services of electricity
92	40.2	4	Manufactured gas and distribution services of gaseous fuels through mains
93	40.3	4	Steam and hot water supply services
94	41	3	COLLECTED AND PURIFIED WATER; DISTRIBUTION SERVICES OF WATER
95	45	3	CONSTRUCTION WORK
96	50.a	4	Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and accessories
97	50.b	4	Retail trade services of motor fuel
98	51	3	WHOLESALE TRADE AND COMMISSION TRADE SERVICES, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES
99	52	3	RETAIL TRADE SERVICES, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES; REPAIR SERVICES OF PERSONAL AND HOUSEHOLD GOODS
100	55	3	HOTEL AND RESTAURANT SERVICES
101	60.1	4	Railway transportation services
102	60.2	4	Other land transportation services

103	60.3	4	Transportation services via pipelines
104	61.10	5	Sea and coastal water transportation services
105	61.20	5	Inland water transportation services
106	62	3	AIR TRANSPORT SERVICES
107	63	3	SUPPORTING AND AUXILIARY TRANSPORT SERVICES; TRAVEL AGENCY SERVICES
108	64	3	POST AND TELECOMMUNICATION SERVICES
109	65	3	FINANCIAL INTERMEDIATION SERVICES, EXCEPT INSURANCE AND PENSION FUNDING SERVICES
110	66	3	INSURANCE AND PENSION FUNDING SERVICES, EXCEPT COMPULSORY SOCIAL SECURITY SERVICES
111	67	3	SERVICES AUXILIARY TO FINANCIAL INTERMEDIATION
112	70	3	REAL ESTATE SERVICES
113	71	3	RENTING SERVICES OF MACHINERY AND EQUIPMENT WITHOUT OPERATOR AND OF PERSONAL AND HOUSEHOLD GOODS
114	72	3	COMPUTER AND RELATED SERVICES
115	73	3	RESEARCH AND DEVELOPMENT SERVICES
116	74	3	OTHER BUSINESS SERVICES
117	75	3	PUBLIC ADMINISTRATION AND DEFENCE SERVICES; COMPULSORY SOCIAL SECURITY SERVICES
118	80	3	EDUCATION SERVICES
119	85	3	HEALTH AND SOCIAL WORK SERVICES
120	90.01	5	Collection and treatment services of sewage
121	90.02.a	6	collection of waste
122	90.02.b	6	Incineration of waste
123	90.02.c	6	Landfill of waste
124	90.03	5	Sanitation, remediation and similar services
125	91	3	MEMBERSHIP ORGANIZATION SERVICES N.E.C.
126	92	3	RECREATIONAL, CULTURAL AND SPORTING SERVICES
127	93	3	OTHER SERVICES



Errore. L'origine riferimento non è stata trovata.

128	95	3	SERVICES OF HOUSEHOLDS AS EMPLOYERS OF DOMESTIC STAFF
129	99	3	SERVICES PROVIDED BY EXTRA-TERRITORIAL ORGANIZATIONS AND BODIES

Appendix III.

China class.	China name	EXIOPOL No.	EXIOPOL Code	EXIOPOL name
10011	Salt mining	32	14.3	Chemical and fertilizer minerals, salt and other mining and quarrying products n.e.c.
10012	Non-metal minerals and other mining	31	14.2	Sand and clay
13013	Grain mill products	41	15.i	Food products nec
13014	forage	36	15.d	Meat products nec
13015	vegetable oil refining	37	15.e	products of Vegetable oils and fats
13016	Sugar manufacturing	40	15.h	Sugar
13017	Slaughtering and meat processing	33	15.a	products of meat cattle
13018	Fish and fish productions	43	15.k	Fish products
13019	All other food manufacturing	41	15.i	Food products nec
15020	Wines, spirits and liquors	42	15.j	Beverages
15021	Soft drink and other beverage	42	15.j	Beverages
16022	Tobacco products	44	16	TOBACCO PRODUCTS
17023	Cotton textiles	45	17	TEXTILES
17024	Woolen textiles	45	17	TEXTILES
17025	Hemp textiles	45	17	TEXTILES
17026	Textiles productions	45	17	TEXTILES
17027	Knitted and crocheted fabrics and articles	46	18	WEARING APPAREL; FURS
18028	Wearing apparel	46	18	WEARING APPAREL; FURS
19029	Leather, fur, down and related products	47	19	LEATHER AND LEATHER PRODUCTS
20030	Products of wood, bamboo, cane, palm, straw	48	20	WOOD AND PRODUCTS OF WOOD AND CORK (EXCEPT FURNITURE); ARTICLES OF STRAW AND PLAING MATERIALS
21031	Furniture	81	36	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
22032	Paper and paper products	49	21	PULP, PAPER AND PAPER PRODUCTS
23033	Printing, reproduction of recording media	50	22	PRINTED MATTER AND RECORDED MEDIA
24034	Stationary and related products	81	36	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
24035	Toys, sporting and athletic and recreation products	81	36	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
25036	Petroleum and nuclear processing	52	23.20.a	motor spirit (gasoline)
25037	Coking	51	23.10	Coke oven products
26038	Basic chemicals	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES

26039	Chemical fertilizers	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
26040	Chemical pesticides	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
26041	paints, varnishes and similar coatings, printing ink and mastics	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
26042	Man-made chemical products	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
26043	Special chemical products	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
26044	Chemical products for daily use	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
27045	Medical and pharmaceutical products	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
28046	Chemical fibers	59	24	CHEMICALS, CHEMICAL PRODUCTS AND MAN-MADE FIBRES
29047	Rubber products	60	25	RUBBER AND PLASTIC PRODUCTS
30048	Plastic products	60	25	RUBBER AND PLASTIC PRODUCTS
31049	Cement, lime and plaster	64	26.d	Cement, lime and plaster
31050	Glass and glass products	61	26.a	Glass and glass products
31051	Pottery, china and earthenware	62	26.b	Ceramic goods
31052	Fireproof materials	62	26.b	Ceramic goods
31053	Other non-metallic mineral products	63	26.c	Bricks, tiles and construction products, in baked clay
32054	Iron-smelting	66	27.a	basic iron and steel and of ferro-alloys and first products thereof
32055	Steel-smelting	66	27.a	basic iron and steel and of ferro-alloys and first products thereof
32056	Steel pressing	66	27.a	basic iron and steel and of ferro-alloys and first products thereof
32057	Alloy iron smelting	66	27.a	basic iron and steel and of ferro-alloys and first products thereof
33058	Nonferrous metal smelting	68	27.c	Aluminium and aluminium products
33059	Nonferrous metal pressing	68	27.c	Aluminium and aluminium products

34060	Metal products	73	28	FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT
35061	Boiler, engines and turbine	74	29	MACHINERY AND EQUIPMENT N.E.C.
35062	Metalworking machinery	74	29	MACHINERY AND EQUIPMENT N.E.C.
35063	Other general industrial machinery	74	29	MACHINERY AND EQUIPMENT N.E.C.
36064	Agriculture, forestry, animal husbandry and fishing machinery	74	29	MACHINERY AND EQUIPMENT N.E.C.
36065	Other special industrial equipment	74	29	MACHINERY AND EQUIPMENT N.E.C.
37066	Railroad transport equipment	80	35	OTHER TRANSPORT EQUIPMENT
37067	Motor vehicles	79	34	MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS
37068	Parts and accessories for motor vehicles and their engines	79	34	MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS
37069	Ship building	80	35	OTHER TRANSPORT EQUIPMENT
37071	Other transport equipment	80	35	OTHER TRANSPORT EQUIPMENT
39072	Generators	76	31	ELECTRICAL MACHINERY AND APPARATUS N.E.C.
39073	Household electric appliances	76	31	ELECTRICAL MACHINERY AND APPARATUS N.E.C.
39074	Other electric machinery and equipment	76	31	ELECTRICAL MACHINERY AND APPARATUS N.E.C.
40075	Telecommunication equipment	77	32	RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS
40076	Electronic computer	75	30	OFFICE MACHINERY AND COMPUTERS
40077	Other computer peripheral equipment	75	30	OFFICE MACHINERY AND COMPUTERS
40078	Electronic element and device	76	31	ELECTRICAL MACHINERY AND APPARATUS N.E.C.
40079	Radio, television and communication equipment and apparatus	77	32	RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS
40080	Other electronic and communication equipment	77	32	RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS

41081	Instruments, meters and other measuring equipment	78	33	MEDICAL, PRECISION AND OPTICAL INSTRUMENTS; WATCHES AND CLOCKS
41082	Cultural and office equipment	75	30	OFFICE MACHINERY AND COMPUTERS
42083	Arts and crafts products	81	36	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
42084	Other manufacturing products	81	36	FURNITURE; OTHER MANUFACTURED GOODS N.E.C.
44086	Electricity, steam and hot water production and supply	84	40.11.a	Electricity by coal
45087	Gas production and supply	92	40.2	Manufactured gas and distribution services of gaseous fuels through mains
46088	Water production and supply	94	41	COLLECTED AND PURIFIED WATER; DISTRIBUTION SERVICES OF WATER
47089	Construction	95	45	CONSTRUCTION WORK
51090	Railway passenger transport	101	60.1	Railway transportation services
51091	Railway freight transport	10	01.j	Pigs
52092	Road transport	102	60.2	Other land transportation services
53093	Urban public transport service of passengers	102	60.2	Other land transportation services
54094	Water transport	104	61.10	Sea and coastal water transportation services
55095	Air passenger transport	106	62	AIR TRANSPORT SERVICES
58098	Storage and warehousing	107	63	SUPPORTING AND AUXILIARY TRANSPORT SERVICES; TRAVEL AGENCY SERVICES
59099	Post services	108	64	POST AND TELECOMMUNICATION SERVICES
60100	Telecommunication	108	64	POST AND TELECOMMUNICATION SERVICES
61101	Computer services and software	114	72	COMPUTER AND RELATED SERVICES
63102	Wholesale and retail trade services	98	51	WHOLESALE TRADE AND COMMISSION TRADE SERVICES, EXCEPT OF MOTOR VEHICLES AND MOTORCYCLES
66103	Accommodation	100	55	HOTEL AND RESTAURANT SERVICES
67104	Food serving services	100	55	HOTEL AND RESTAURANT SERVICES

68105	Finance	109	65	FINANCIAL INTERMEDIATION SERVICES, EXCEPT INSURANCE AND PENSION FUNDING SERVICES
70106	Insurance	110	66	INSURANCE AND PENSION FUNDING SERVICES, EXCEPT COMPULSORY SOCIAL SECURITY SERVICES
72107	Real estate	112	70	REAL ESTATE SERVICES
73108	Rental services	113	71	RENTING SERVICES OF MACHINERY AND EQUIPMENT WITHOUT OPERATOR AND OF PERSONAL AND HOUSEHOLD GOODS
74109	Business services	116	74	OTHER BUSINESS SERVICES
74110	Travel agency, tour operator and tourist guide services	107	63	SUPPORTING AND AUXILIARY TRANSPORT SERVICES; TRAVEL AGENCY SERVICES
75111	Scientific research	115	73	RESEARCH AND DEVELOPMENT SERVICES
76112	Scientific and technical services	115	73	RESEARCH AND DEVELOPMENT SERVICES
78113	Geological, geophysical and other prospecting services	115	73	RESEARCH AND DEVELOPMENT SERVICES
79114	Water conservancy	120	90.01	Collection and treatment services of sewage
80115	Environment, resource and other social services	120	90.01	Collection and treatment services of sewage
82116	Resident and other personal services	128	95	SERVICES OF HOUSEHOLDS AS EMPLOYERS OF DOMESTIC STAFF
84117	Educational services	118	80	EDUCATION SERVICES
85118	Health	119	85	HEALTH AND SOCIAL WORK SERVICES
86119	Social security and welfare	117	75	PUBLIC ADMINISTRATION AND DEFENCE SERVICES; COMPULSORY SOCIAL SECURITY SERVICES
88120	Cultural and arts, radio, film and television services	126	92	RECREATIONAL, CULTURAL AND SPORTING SERVICES
91121	Sports services	126	92	RECREATIONAL, CULTURAL AND SPORTING SERVICES
92122	Recreational services	126	92	RECREATIONAL, CULTURAL AND SPORTING SERVICES

93123	Public administration and other sectors	117	75	PUBLIC ADMINISTRATION AND DEFENCE SERVICES; COMPULSORY SOCIAL SECURITY SERVICES
01001	Agriculture, Forestry, Animal Husbandry & Fishery	1	01.a	Paddy rice
02002	Forestry	16	2	PRODUCTS OF FORESTRY, LOGGING AND RELATED SERVICES
02003	Logging and transport of timber and bamboo	16	2	PRODUCTS OF FORESTRY, LOGGING AND RELATED SERVICES
03004	Animal husbandry	8	01.h	Crops nec
04005	Fishery	17	5	FISH AND OTHER FISHING PRODUCTS; SERVICES INCIDENTAL TO FISHING
05006	Technical services for agriculture, forestry, livestock and fishing	13	01.m	Animal products nec
06007	Mining and Washing of Coal	18	10	COAL AND LIGNITE; PEAT
07008	Extraction of petroleum and natural gas	19	11.a	crude petroleum and services related to crude oil extraction, excluding surveying
08009	Ferrous metal ore mining	23	13.10	Iron ores
09010	Non-ferrous metal ore mining	24	13.20.a	Copper ores and concentrates
43085	Scrap and waste	82	37.10	Metal secondary raw materials
55096	Air freight transport	106	62	AIR TRANSPORT SERVICES
56097	Pipelines transport	102	60.2	Other land transportation services

Appendix IV.

1111A0	01.e	Oil seeds
1111B0	01.a; 01.b; 01.c	
111200	01.d	Vegetables, fruit, nuts
111335	01.d	Vegetables, fruit, nuts
1113A0	01.d	Vegetables, fruit, nuts
111400	01.d	Vegetables, fruit, nuts
111910	01.h	Crops nec
111920	01.g	Plant-based fibres
1119A0	01.f	Sugar cane, sugar beet
1119B0	01.h	Crops nec
112120	01.i	Cattle
1121A0	01.i	Cattle
112300	01.k	Poultry
112A00	01.j; 01.l; 01.m	
113300	02	Products of Forestry, Logging and Related Services
113A00	02	Products of Forestry, Logging and Related Services
114100	05	Fish and other fishing products; Services incidental to fishing
114200	01.y?	Hunting and trapping
115000	01.z?	Support activities for agriculture and forestry
211000	11.a; 11.b; 11.c	
212100	10	Coal and Lignite; Peat
212210	13.10	Iron ores
212230	13.20a; 13.20.b; 13.20.e	
2122A0	12; 13.20.c; 13.20.d; 13.20.d; 13.20.f	
212310	14.1	Stone
212320	14.2	Sand and Clay
212390	14.3	Chemical and fertilizer minerals, salt and other mining and quarrying products nec
213111	11.a; 11.b; 11.c	
213112	11.a; 11.b; 11.c	
21311A	14.z?	Support activities for other mining
221100	40.11.a - 40.11.f; 14.12; 14.13	
221200	40.2	manufactured gas and distribution services of gaseous fuels through mains
221300	40.3; 41; 90.01	
230101	45	Construction work

230102	45	Construction work
230103	45	Construction work
230201	45	Construction work
230202	45	Construction work
230301	45	Construction work
230302	45	Construction work
311111	15.i	Food products nec
311119	15.i	Food products nec
311210	15.g	Processed rice
311221	15.e	Products of vegetable oils and fats
311225	15.e	Products of vegetable oils and fats
31122A	15.e	Products of vegetable oils and fats
311230	15.i	Food products nec
311313	15.h	Sugar
31131A	15.h	Sugar
311320	15.i	Food products nec
311330	15.i	Food products nec
311340	15.i	Food products nec
311410	15.i	Food products nec
311420	15.i	Food products nec
311513	15.f	Dairy products
311514	15.f	Dairy products
31151A	15.f	Dairy products
311520	15.f	Dairy products
311615	15.c	Products of meat poultry
31161A	15.a; 15.b; 15.d	
311700	15.k	Fish products
311810	15.i	Food products nec
311820	15.i	Food products nec
311830	15.i	Food products nec
311910	15.i	Food products nec
311920	15.i	Food products nec
311930	15.i	Food products nec
311940	15.i	Food products nec
311990	15.i	Food products nec
312110	15.j	Beverages
312120	15.j	Beverages
312130	15.j	Beverages
312140	15.j	Beverages
3122A0	16	Tobacco products
313100	17	Textiles
313210	17	Textiles
313220	17	Textiles
313230	17	Textiles
313240	17	Textiles
313310	17	Textiles
313320	17	Textiles
314110	17	Textiles
314120	17	Textiles

314910	17	Textiles
314990	17	Textiles
315100	18	Wearing apparel; Furs
315210	18	Wearing apparel; Furs
315220	18	Wearing apparel; Furs
315230	18	Wearing apparel; Furs
315290	18	Wearing apparel; Furs
315900	18	Wearing apparel; Furs
316100	19	Leather and leather products
316200	19	Leather and leather products
316900	19	Leather and leather products
321100	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321219	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
32121A	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
32121B	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321910	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321920	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321991	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321992	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
321999	20	Wood and products of wood and cork (except furniture); Articles of straw and plaiting materials
322110	21	Pulp, Paper and paper products
322120	21	Pulp, Paper and paper products
322130	21	Pulp, Paper and paper products
322210	21	Pulp, Paper and paper products
32222A	21	Pulp, Paper and paper products
32222B	21	Pulp, Paper and paper products
322230	21	Pulp, Paper and paper products
322291	21	Pulp, Paper and paper products
322299	21	Pulp, Paper and paper products
323110	22	Printed matter and recorded media
323120	22	Printed matter and recorded media

324110	23.10; 23.20.a; 23.20.b; 23.20.c; 23.20.d; 23.20.e; 23.20.f; 23.30	
324121	23.10; 23.20.a; 23.20.b; 23.20.c; 23.20.d; 23.20.e; 23.20.f; 23.30	
324122	23.10; 23.20.a; 23.20.b; 23.20.c; 23.20.d; 23.20.e; 23.20.f; 23.30	
324191	23.10; 23.20.a; 23.20.b; 23.20.c; 23.20.d; 23.20.e; 23.20.f; 23.30	
324199	23.10; 23.20.a; 23.20.b; 23.20.c; 23.20.d; 23.20.e; 23.20.f; 23.30	
325110	24	Chemicals, chemical products and man-made fibres
325120	24	Chemicals, chemical products and man-made fibres
325130	24	Chemicals, chemical products and man-made fibres
325181	24	Chemicals, chemical products and man-made fibres
325182	24	Chemicals, chemical products and man-made fibres
325188	24	Chemicals, chemical products and man-made fibres
325190	24	Chemicals, chemical products and man-made fibres
325211	24	Chemicals, chemical products and man-made fibres
325212	24	Chemicals, chemical products and man-made fibres
325220	24	Chemicals, chemical products and man-made fibres
325310	24	Chemicals, chemical products and man-made fibres

325320	24	Chemicals, chemical products and man-made fibres
325411	24	Chemicals, chemical products and man-made fibres
325412	24	Chemicals, chemical products and man-made fibres
325413	24	Chemicals, chemical products and man-made fibres
325414	24	Chemicals, chemical products and man-made fibres
325510	24	Chemicals, chemical products and man-made fibres
325520	24	Chemicals, chemical products and man-made fibres
325610	24	Chemicals, chemical products and man-made fibres
325620	24	Chemicals, chemical products and man-made fibres
325910	24	Chemicals, chemical products and man-made fibres
3259A0	24	Chemicals, chemical products and man-made fibres
326110	25	Rubber and plastic products
326121	25	Rubber and plastic products
326122	25	Rubber and plastic products
326130	25	Rubber and plastic products
326140	25	Rubber and plastic products
326150	25	Rubber and plastic products
326160	25	Rubber and plastic products
32619A	25	Rubber and plastic products
326210	25	Rubber and plastic products
326220	25	Rubber and plastic products
326290	25	Rubber and plastic products
32711A	26.b	Ceramic goods
32712A	26.c	Bricks, tiles and construction products in baked clay
32712B	26.c	Bricks, tiles and construction products in baked clay
327211	26.a	Glass and glass products
327212	26.a	Glass and glass products
327213	26.a	Glass and glass products
327215	26.a	Glass and glass products
327310	26.d	Cement, lime and Plaster
327320	26.d	Cement, lime and Plaster
327330	26.d	Cement, lime and Plaster
327390	26.d	Cement, lime and Plaster
3274A0	26.d	Cement, lime and Plaster
327910	26.e	Other non-metallic mineral products
327991	26.e	Other non-metallic mineral products
327992	26.e	Other non-metallic mineral products
327993	26.e	Other non-metallic mineral products

327999	26.e	Other non-metallic mineral products
331110	27.a	Basic iron and steel and of ferro-alloys and first products thereof
331200	27.a	Basic iron and steel and of ferro-alloys and first products thereof
331314	27.c	Aluminium and aluminium products
33131A	27.c	Aluminium and aluminium products
33131B	27.c	Aluminium and aluminium products
331411	27.d	Lead, zinc and tin and products thereof
331419	27.d	Lead, zinc and tin and products thereof
331420	27.e	Copper products
331490	27.f	Other non-ferrous metal products
331510	27.g	Foundry work services
331520	27.g	Foundry work services
332114	28	Fabricated metal products, except machinery and equipment
33211A	28	Fabricated metal products, except machinery and equipment
33211B	28	Fabricated metal products, except machinery and equipment
33221A	28	Fabricated metal products, except machinery and equipment
33221B	28	Fabricated metal products, except machinery and equipment
332310	28	Fabricated metal products, except machinery and equipment
332320	28	Fabricated metal products, except machinery and equipment
332410	28	Fabricated metal products, except machinery and equipment
332420	28	Fabricated metal products, except machinery and equipment
332430	28	Fabricated metal products, except machinery and equipment
332500	28	Fabricated metal products, except machinery and equipment
332600	28	Fabricated metal products, except machinery and equipment
332710	28	Fabricated metal products, except machinery and equipment
332720	28	Fabricated metal products, except machinery and equipment
332800	28	Fabricated metal products, except machinery and equipment
332913	28	Fabricated metal products, except machinery and equipment
33291A	28	Fabricated metal products, except machinery and equipment
332991	28	Fabricated metal products, except machinery and equipment

332996	28	Fabricated metal products, except machinery and equipment
33299A	28	Fabricated metal products, except machinery and equipment
33299B	28	Fabricated metal products, except machinery and equipment
33299C	28	Fabricated metal products, except machinery and equipment
333111	29	Machinery and equipment nec
333112	29	Machinery and equipment nec
333120	29	Machinery and equipment nec
333130	29	Machinery and equipment nec
333220	29	Machinery and equipment nec
333295	29	Machinery and equipment nec
33329A	29	Machinery and equipment nec
333314	29	Machinery and equipment nec
333315	29	Machinery and equipment nec
333319	29	Machinery and equipment nec
33331A	29	Machinery and equipment nec
333414	29	Machinery and equipment nec
333415	29	Machinery and equipment nec
33341A	29	Machinery and equipment nec
333511	29	Machinery and equipment nec
333514	29	Machinery and equipment nec
333515	29	Machinery and equipment nec
33351A	29	Machinery and equipment nec
33351B	29	Machinery and equipment nec
333611	29	Machinery and equipment nec
333612	29	Machinery and equipment nec
333613	29	Machinery and equipment nec
333618	29	Machinery and equipment nec
333911	29	Machinery and equipment nec
333912	29	Machinery and equipment nec
333920	29	Machinery and equipment nec
333991	29	Machinery and equipment nec
333993	29	Machinery and equipment nec
333994	29	Machinery and equipment nec
33399A	29	Machinery and equipment nec
33399B	29	Machinery and equipment nec
334111	30	Office machinery and computers
334112	30	Office machinery and computers
33411A	30	Office machinery and computers
334210	32	Radio, television and communication equipment and apparatus
334220	32	Radio, television and communication equipment and apparatus
334290	32	Radio, television and communication equipment and apparatus
334300	32	Radio, television and communication equipment and apparatus

334411	32	Radio, television and communication equipment and apparatus
334412	32	Radio, television and communication equipment and apparatus
334413	32	Radio, television and communication equipment and apparatus
334417	32	Radio, television and communication equipment and apparatus
334418	32	Radio, television and communication equipment and apparatus
334419	32	Radio, television and communication equipment and apparatus
33441A	32	Radio, television and communication equipment and apparatus
334510	33	Medical, precision and optical instruments; watches and clocks
334511	33	Medical, precision and optical instruments; watches and clocks
334512	33	Medical, precision and optical instruments; watches and clocks
334513	33	Medical, precision and optical instruments; watches and clocks
334514	33	Medical, precision and optical instruments; watches and clocks
334515	33	Medical, precision and optical instruments; watches and clocks
334516	33	Medical, precision and optical instruments; watches and clocks
334517	33	Medical, precision and optical instruments; watches and clocks
33451A	33	Medical, precision and optical instruments; watches and clocks
334613	33	Medical, precision and optical instruments; watches and clocks
33461A	33	Medical, precision and optical instruments; watches and clocks
335110	31	Electrical machinery and apparatus nec
335120	31	Electrical machinery and apparatus nec
335210	31	Electrical machinery and apparatus nec
335221	31	Electrical machinery and apparatus nec
335222	31	Electrical machinery and apparatus nec
335224	31	Electrical machinery and apparatus nec
335228	31	Electrical machinery and apparatus nec
335311	31	Electrical machinery and apparatus nec
335312	31	Electrical machinery and apparatus nec
335313	31	Electrical machinery and apparatus nec
335314	31	Electrical machinery and apparatus nec
335911	31	Electrical machinery and apparatus nec
335912	31	Electrical machinery and apparatus nec
335920	31	Electrical machinery and apparatus nec
335930	31	Electrical machinery and apparatus nec

335991	31	Electrical machinery and apparatus nec
335999	31	Electrical machinery and apparatus nec
336111	34	Motor vehicles, trailers and semi-trailers
336112	34	Motor vehicles, trailers and semi-trailers
336120	34	Motor vehicles, trailers and semi-trailers
336211	34	Motor vehicles, trailers and semi-trailers
336212	34	Motor vehicles, trailers and semi-trailers
336213	34	Motor vehicles, trailers and semi-trailers
336214	34	Motor vehicles, trailers and semi-trailers
336300	34	Motor vehicles, trailers and semi-trailers
336411	35	Other transport equipment
336412	35	Other transport equipment
336413	35	Other transport equipment
336414	35	Other transport equipment
33641A	35	Other transport equipment
336500	35	Other transport equipment
336611	35	Other transport equipment
336612	35	Other transport equipment
336991	35	Other transport equipment
336992	35	Other transport equipment
336999	35	Other transport equipment
337110	36	Furniture, other manufactured goods nec
337121	36	Furniture, other manufactured goods nec
337122	36	Furniture, other manufactured goods nec
337127	36	Furniture, other manufactured goods nec
33712A	36	Furniture, other manufactured goods nec
337212	36	Furniture, other manufactured goods nec
337215	36	Furniture, other manufactured goods nec
33721A	36	Furniture, other manufactured goods nec
337910	36	Furniture, other manufactured goods nec
337920	36	Furniture, other manufactured goods nec
339111	33	Medical, precision and optical instruments; watches and clocks
339112	33	Medical, precision and optical instruments; watches and clocks
339113	33	Medical, precision and optical instruments; watches and clocks
339114	33	Medical, precision and optical instruments; watches and clocks
339115	33	Medical, precision and optical instruments; watches and clocks
339116	33	Medical, precision and optical instruments; watches and clocks
339910	36	Furniture, other manufactured goods nec
339920	36	Furniture, other manufactured goods nec
339930	36	Furniture, other manufactured goods nec
339940	36	Furniture, other manufactured goods nec
339950	36	Furniture, other manufactured goods nec
339991	36	Furniture, other manufactured goods nec
339992	36	Furniture, other manufactured goods nec

339994	36	Furniture, other manufactured goods nec
33999A	36	Furniture, other manufactured goods nec
420000	51; 50.a	
481000	62	Air transport services
482000	60.1	Railway transport services
483000	61.10; 61.20	
484000	60.2	Other land transport services
485000	60.2	Other land transport services
486000	60.3	Transportation services via pipelines
48A000	63	Supporting and auxiliary transport services; Travel agency services
491000	64	Post and telecommunication services
492000	64	Post and telecommunication services
493000	63	Supporting and auxiliary transport services; Travel agency services
4A0000	52; 50.a; 50.b	
511110	22	Printed matter and recorded media
511120	22	Printed matter and recorded media
511130	22	Printed matter and recorded media
5111A0	22	Printed matter and recorded media
511200	22	Printed matter and recorded media
512100	92	Recreational, cultural and sporting services
512200	92	Recreational, cultural and sporting services
515100	92	Recreational, cultural and sporting services
515200	92	Recreational, cultural and sporting services
516110	92	Recreational, cultural and sporting services
517000	64	Post and telecommunication services
518100	64	Post and telecommunication services
518200	64	Post and telecommunication services
519100	92	Recreational, cultural and sporting services
522A00	65	Financial intermediation services, except insurance and pension funding services
523000	65	Financial intermediation services, except insurance and pension funding services
524100	66	Insurance and pension funding services, except compulsary social security services
524200	66	Insurance and pension funding services, except compulsary social security services
525000	66	Insurance and pension funding services, except compulsary social security services
52A000	65	Financial intermediation services, except insurance and pension funding services
531000	70	Real estate services
532100	71	Renting services of machinery and equipment without operator and of personal and household goods
532230	71	Renting services of machinery and equipment without operator and of personal and household goods

532400	71	Renting services of machinery and equipment without operator and of personal and household goods
532A00	71	Renting services of machinery and equipment without operator and of personal and household goods
533000	74	Other business services
541100	74	Other business services
541200	74	Other business services
541300	74	Other business services
541400	74	Other business services
541511	72	Computer and related services
541512	72	Computer and related services
54151A	72	Computer and related services
541610	74	Other business services
5416A0	74	Other business services
541700	73	Research and development services
541800	74	Other business services
541920	74	Other business services
541940	85	Health and social work services
5419A0	74	Other business services
550000	74	Other business services
561100	74	Other business services
561200	74	Other business services
561300	74	Other business services
561400	74	Other business services
561500	63	Supporting and auxiliary transport services; Travel agency services
561600	74	Other business services
561700	74	Other business services
561900	74	Other business services
562000	90.01 - 90.03	
611100	80	Educational services
611A00	80	Educational services
611B00	80	Educational services
621600	85	Health and social work services
621A00	85	Health and social work services
621B00	85	Health and social work services
622000	85	Health and social work services
623000	85	Health and social work services
624200	85	Health and social work services
624400	85	Health and social work services
624A00	85	Health and social work services
711100	92	Recreational, cultural and sporting services
711200	92	Recreational, cultural and sporting services
711500	92	Recreational, cultural and sporting services
711A00	92	Recreational, cultural and sporting services
712000	92	Recreational, cultural and sporting services
713940	92	Recreational, cultural and sporting services
713950	92	Recreational, cultural and sporting services

713A00	92	Recreational, cultural and sporting services
713B00	92	Recreational, cultural and sporting services
7211A0	55	Hotel and restaurant services
721A00	55	Hotel and restaurant services
722000	55	Hotel and restaurant services
811192	50.a	Sale, maintenance, repair of motor vehicles, motor vehicle parts, motorcycles, motor cycle parts and accesorries
8111A0	50.a	Sale, maintenance, repair of motor vehicles, motor vehicle parts, motorcycles, motor cycle parts and accesorries
811200	52	Retail trade services, except of motor vehicles and motor cycles; Repair services of personal and household goods
811300	52	Retail trade services, except of motor vehicles and motor cycles; Repair services of personal and household goods
811400	52	Retail trade services, except of motor vehicles and motor cycles; Repair services of personal and household goods
812100	93	Other services
812200	93	Other services
812300	93	Other services
812900	93	Other services
813100	91	membership organization services nec
813A00	91	membership organization services nec
813B00	91	membership organization services nec
814000	95	Services of households as employers of domestic staff
S00101	75	Public administration and defence services; Compulsary social security contributions
S00102	75	Public administration and defence services; Compulsary social security contributions
S00201	75	Public administration and defence services; Compulsary social security contributions
S00202	75	Public administration and defence services; Compulsary social security contributions
S00203	75	Public administration and defence services; Compulsary social security contributions
S00300	S00300	Noncomparable imports
S00401	37.10; 37.20	
S00402	S00402	Used and secondhand goods
S00500	75	Public administration and defence services; Compulsary social security contributions
S00600	75	Public administration and defence services; Compulsary social security contributions
S00700	75	Public administration and defence services; Compulsary social security contributions
S00800	70	Real estate services
S00900	S00900	Rest of the World adjustments
V00100	V00100	Compensation of employees



Errore. L'origine riferimento non è stata trovata.

V00200	V00200	Taxes on production and inports, less subsidies
V00300	V00300	Gross operating surplus

Annex II: Contributors to the report

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