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Process of Import of Hybrid and Electric Cars by Individual

Maicon Francisco Bento

Bachelor of Foreign Trade

The University of Vale Do Itajaí

Univali, Itajaí, Santa Catarina

Brazil

E-mail: maiconfrancisco911@gmail.com

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Abstract

International trade is naturally linked to globalization and sustainability stands out for demonstrating the importance of this combination, such as the use of resources with greater responsibility in a way that can prevent scarcity. In order to assess economic expansion and preserve the environment, the United Nations defined sustainable development as the ability to continue the development of society in a way that meets the needs of current generations and ensures the needs of future generations. In Brazil, the hybrid and electric car market moves at a slow speed, as the high cost and bureaucracy in imports makes it difficult to sell in the domestic market for companies and acquisitions for individuals. In this way, this research had as general objective, to analyze the procedures of the import process of hybrid and electric cars by individuals. Thus, the study carried out had as specific objectives to present an overview of the segment of the automobile industry that have propulsion from clean energy sources, to evaluate the preparatory procedures for an individual to import an electric or hybrid vehicle, in addition to verifying the import steps for a hybrid and electric vehicle and the possible costs involved. This research was carried out using the qualitative approach method and for data collection, documental research was carried out and the results were presented in a descriptive way. The sources used for the study were the websites of government agencies and international institutions, so it was possible to develop this study so that the reader has a better understanding of the topics covered. A brief approach to the international market was carried out, in addition to evaluating the future of the Brazilian market in relation to the evolution of clean energy in automobiles. There was a need in the short term in the implementation of projects for renewable energy sources, mainly encouraged by the Brazilian government, which will

directly impact air quality and because Brazil has a high tax burden, it makes it difficult for multinational companies to enter invest nationally and import technology.

Keywords: Import, Hybrid and electric vehicles, Sustainability, Physical person

1. Introduction

The processes of import and export of products and services have developed the world economy, in fact, directly in the private and public sectors. This scenario is driven by the facilitation of the communication tools that currently exist in the world and that are necessary for the evolution of the competitiveness of the countries. There is a concern of the world population with the level of environmental quality, so it became necessary to develop alternatives to improve the quality of life, especially in large centers. In this case, there is still an abundance of automobiles that contribute to the emission of polluting gases by fossil fuel, causing more damage to the environment and the citizen of large cities.

There is an increase in mortality statistics related to pollution in several regions of the world, where accelerated urban development and combustion means of transport directly affect the quality of oxygen in the atmosphere. According to the World Health Organization (WHO), air pollution kills 7 million people a year, mostly in poor countries (WHO, 2018). In this way, there is a need to encourage society to use means that can minimize any harmful impact on the environment.

Thus, the process of importing cars in Brazil that use fuels from renewable sources, despite being complex due to the different rules and the high value related to taxes, can be an alternative to change the scenario and the automotive market in the country.

Based on the current scenario regarding the quality of the environment and regarding the technology applied to minimize the impact of vehicles that use fuels from non-renewable sources, it was identified the need to carry out a study that can contribute to the knowledge of models vehicles that use up to 100% renewable energy source. In addition, presents data related to the automotive market. In this sense, this work had a general objective, to study the process of importing electric and hybrid cars, raising the costs involved in this operation.

To this end, specific objectives have developed that highlight the importance of international trade for economic development, with an analysis of the panorama of Brazilian imports, information was collected on the renewable energy sector in Brazil and the world, listing the use of cars that use fuels from renewable sources, in addition to the procedures for importation by individuals, identifying the costs involved in the entire process.

2. Justification for Carrying out the Study

The planet suffers heavily from pollution and one of the sources that have a direct and negative impact is the emission of toxic gases released directly into the atmosphere. For humanity to have a better quality of life, it is essential to use technology for the benefit of developing new means of survival, which have less impact on the environment.

Based on this scenario, it was identified the need to talk about the use of vehicles that use fuels

with renewable energy sources, thus causing less impact on the environment. Brazil currently lacks the technology and resources to manufacture electric and hybrid cars, so there is a need to import them.

This is also an alternative for this sector to stand out in the national market through the implementation of environmental sustainability policies, in addition to having a social impact, this conduct generates value for its economic partners. Thus, the use of renewable energy sources, such as electric and hybrid vehicles, is one of the alternatives to minimize the impacts of the respective businesses that exploit the natural resources of the environment.

For society, the approach was important, as it can expand the knowledge of individuals, and entrepreneurs about the importance of these vehicles, in addition to the benefit of access to more sustainable alternatives, which consequently can bring a better quality of life. Due to the contribution to future research, this project was relevant to the academic area, due to the research and procedures used in the process of data import and analysis, and this work will be available for future studies.

With this work, the academic had the opportunity to improve his knowledge developed throughout the course and analyze a market trend that directly impacts the quality of life of society. Regarding the feasibility of this work, research was carried out through information in books, magazines of the genre, government websites, and other internet tools.

3. Methodological Aspects

The methodology applied in the development of this work was qualitative, which aims to understand information collected to add new insights or hypotheses to the research. The qualitative method differs from the quantitative when it does not employ a statistical instrument based on the analysis of a problem. (RICHARDSON, 1999).

Regarding the methods of data collection, it was through bibliography that we sought to survey relevant magazines and books for the research carried out (MEDEIROS, 2008).

The descriptive process in this case analyzes the identification, recording, and study of characteristics, factors, or variables that relate to the phenomenon or process. In this research model, the researcher has no connection, he will evaluate the frequency with that the phenomena occur, their structures, and the way they are carried out.

4. Data Collection and Analysis Techniques

The data present in the work were collected from secondary sources, such as internet research, books, government websites such as Detran, the Ministry of Industry, Foreign Trade and Services, and articles that are related to the theme of this project.

The data collected during the process of formulating the work are presented and explained in the form of texts, tables,s and graphs for a better understanding of the researched topic. The period related to the collection and analysis of the information was in the second half of 2019 and the first half of 2020.

4.1 Market Overview

In this chapter, a balance of Brazilian international trade and the international market in the automotive sector of electric and hybrid cars will be briefly discussed.

4.1.1 Brazilian Foreign Trade

In recent years, international trade has faced several challenges to maintain development, such as the modernization of processes in the logistics chain, the evolution of customs procedures, and the formation of new agreements between countries. According to Hartung (2002), international trade is developed by the need of countries to meet their needs.

The structure of international trade in the 20th century changed its regulations in organizations and countries and directly interfered in the formulation of a new order in world trade. As a driver, globalization moves and adapts to the world so that there are no borders, and adverse scenarios and that, in this way, the exchange of goods and services is facilitated by technology (Souza Ramos, 2004).

With the development of the international economy, began to develop greater comparative advantages in activities based on natural resources, in this way, the pressures to expand the volume of exports, represented one. Now, international trade has become a major driver for economic development, bringing similar forms of growth, and allowing investments to solidly create companies in more technologically developed sectors, operating in complex competition scenarios.

In this way, a country that has an above-average volume of a given natural resource, must expose its production capacity to export a given resource to the interested country, since it does not have technological capacity, it will import inputs from another country, thus characterizing an import, according to Keedi (2012).

Imports in Brazil have always remained close to the volumes exported, the main reason being the characteristics of the products that Brazil has for export, in this case, most are commodities. This profile drives the need to import new technologies.

Table 1. Exports and Imports between 2000 and 2019

YEAR	*EXPORT (A)*	*IMPORT (B)*	*BALANCE(A-B)*	*CURRENT (A+B)*
2000	5.000.307.451	4.869.746.498	130.560.953	9.870.053.949
2001	4.962.092.162	4.843.618.331	118.473.831	9.805.710.493
2002	6.217.907.655	5.011.978.246	1.205.929.409	11.229.885.901
2003	6.097.199.087	4.037.138.310	2.060.060.777	10.134.337.397
2004	8.962.900.814	5.522.542.967	3.440.357.847	14.485.443.781
2005	11.087.455.272	6.048.467.166	5.038.988.106	17.135.922.438
2006	13.645.350.180	7.973.597.590	5.671.752.590	21.618.947.770
2007	14.111.142.334	10.763.401.381	3.347.740.953	24.874.543.715
2008	20.435.789.299	17.147.067.713	3.288.721.586	37.582.857.012
2009	14.137.399.035	11.243.948.773	2.893.450.262	25.381.347.808
2010	17.663.334.713	16.330.730.253	1.332.604.460	33.994.064.966
2011	22.245.125.706	19.110.922.861	3.134.202.845	41.356.048.567
2012	20.982.632.833	18.139.149.673	2.843.483.160	39.121.782.506
2013	20.800.950.742	22.712.863.189	-1.911.912.447	43.513.813.931
2014	23.020.904.817	21.458.551.946	1.562.352.871	44.479.456.763
2015	18.530.260.092	16.137.780.935	2.392.479.157	34.668.041.027
2016	16.327.912.914	11.753.856.964	4.574.055.950	28.081.769.878
2017	18.758.765.145	12.473.405.397	6.285.359.748	31.232.170.542
2018	22.524.534.227	18.651.023.993	3.873.510.234	41.175.558.220
2019	20.054.255.707	17.760.881.718	2.293.373.989	37.815.137.425

Source. Prepared by the Academic based on data from the Ministry of Economy (2019).

Table 1 shows the figures for the Brazilian trade balance between 2000 and 2019 to confirm the proximity between imports and exports.

Table 2. Main commodity suppliers to Brazil

Countries	*2018 - Values FOB (US$)*	*2017 - Values FOB (US$)*	*2016 - Values FOB (US$)*	*2015 - Values FOB (US$)*	*2014 - Valores FOB (US$)*
China	34.730.027.163	27.321.495.733	23.357.532.623	30.714.594.211	37.338.629.829
United States	28.967.774.648	24.846.597.607	23.805.730.109	26.474.508.676	35.010.897.735
Argentina	11.051.062.743	9.435.192.781	9.084.504.606	10.284.441.756	14.142.845.593
Germany	10.557.304.641	9.227.153.320	9.131.501.022	10.382.522.133	13.836.731.656
South Korea	5.380.880.392	5.239.963.389	5.451.108.201	5.420.932.274	8.525.458.259
Mexico	4.909.339.537	4.238.052.128	3.528.288.358	4.377.294.711	5.362.623.357
Italy	4.513.271.911	3.958.368.447	3.702.461.584	4.675.000.373	6.309.946.471
Italy	4.355.617.849	3.762.632.611	3.567.060.731	4.877.323.655	5.900.642.296
France	3.941.976.427	3.723.091.054	3.693.744.654	4.457.290.777	5.699.913.667
India	3.662.823.569	2.945.674.680	2.482.182.224	4.289.498.566	6.640.218.635

Source. Prepared by the Academic based on data from the Ministry of Economy (2019).

The main supplier country of Brazil in the period between 2014 and 2018, was China, followed by the United States and Argentina. Brazil is deficient in manufactured products with low value,

thus China supplies this demand, because it holds the largest share in the supply of products to Brazil, according to table 2.

Table 3. Top countries that Brazil exported in the period

Countries	*2018 - Values FOB (US$)*	*2017 - Values FOB (US$)*	*2016 - Values FOB (US$)*	*2015 - Values FOB (US$)*	*2014 - Valores FOB (US$)*
China	64.205.647.059	47.488.449.966	35.133.314.867	35.549.534.578	40.611.876.675
United States	28.774.085.274	26.872.631.189	23.155.738.824	24.058.509.554	27.023.934.518
Argentina	14.951.216.909	17.618.822.550	13.417.339.572	12.793.412.815	14.277.231.375
Germany	13.068.031.038	9.252.264.969	10.322.786.852	10.043.750.181	13.035.029.822
South Korea	6.389.093.370	5.031.366.706	4.080.526.602	3.977.939.847	4.983.903.057
Mexico	5.214.589.691	4.911.018.150	4.860.766.756	5.177.952.550	6.629.694.497
Italy	5.147.307.782	3.813.820.988	2.604.249.965	2.942.939.740	3.253.929.675
Italy	4.505.139.699	4.514.104.147	3.813.037.793	3.585.817.584	3.668.564.938
France	4.334.337.058	5.263.291.829	4.604.146.067	4.844.327.449	6.717.455.170
India	3.909.881.517	4.657.327.590	3.161.432.097	3.617.195.206	4.787.813.135

Source. Prepared by the Academic based on data from the Ministry of Economy (2019).

China is one of Brazil's main economic partners, because of the profile of Brazilian products exported and that specifically to China are commodities, it is the destination country with the highest annual growth in FOB values (US$) between 2016 and 2018, according to Table 3.

4.1.2 Anuentes Organs

In the structure of Brazilian foreign trade, numerous actors are directly linked to import and export operations. According to Maluf (2000), the intervening bodies are classified as managers, consenting and auxiliary. Addressing all the agencies involved in this research would not be possible, as according to Keedi (2014) there are many agencies that somehow directly interfere in Brazilian foreign trade. In this way, Brazilian foreign trade is subordinated to the Ministry of Economy.

In this research, the main consenting bodies will be addressed, initially by the Chamber of Foreign Trade, which aims to formulate, adopt, implement and coordinate policies and activities related to foreign trade in goods and services, foreign direct investments, Brazilian investments abroad and export financing, to promote increased productivity in the Brazilian economy and the country's international competitiveness (CAMEX, 2015).

The Secretariat of the Federal Revenue of Brazil is characterized by being an agency, which is subordinated to the Ministry of Economy, its responsibility is to administer the taxes within the competence of the Union, in addition to the social security incidents in foreign trade and to be part of the country's social contributions. The SRF subsidizes the Federal Executive Branch regarding the formulation of the Brazilian tax policy and prevents and combats tax evasion,

smuggling, embezzlement, piracy, commercial fraud, trafficking in drugs and endangered animals, and other illicit actions. related to international trade (RECEITA FEDERAL, 2020).

The Integrated Foreign Trade System (SISCOMEX) is a system responsible for completing the activities of registration, monitoring, and control of foreign trade operations. In this way, importers and exporters exchange information with the bodies involved in different stages of the process directly. Thus, they can control and monitor all entry and exit of goods in the country through a single and automated flow (Receita Federal, 2015).

The National Health Surveillance Agency (ANVISA) has the purpose of promoting the protection of the health of the Brazilian population, through sanitary control of the production and consumption of products and services subject to sanitary surveillance, in addition to the environments, processes, inputs, and related technologies. It is also responsible for controlling ports, airports, borders, and customs facilities (Anvisa, 2020).

IBAMA, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) is a federal agency endowed with legal personality under public law, and administrative and financial autonomy, linked to the Ministry of the Environment.

The main attributions are to exercise the power of environmental police, carry out actions of national environmental policies, carry out actions of national environmental policies, referring to federal attributions, related to environmental licensing, environmental quality control, authorization for the use of natural resources, and environmental inspection, monitoring and control, in compliance with the guidelines issued by the Ministry of the Environment (Ibama, 2018).

There is Denatran, the National Traffic Department, the executive body of the National Traffic System with administrative and technical autonomy, in addition to the jurisdiction of the entire Brazilian territory. Its main objective is to inspect and enforce traffic legislation, and enforcement of rules, and guidelines. In addition, it supervises and coordinates the bodies responsible for controlling and inspecting the execution of the National Traffic Policy (Ministério Da Infraestrutura, 2017).

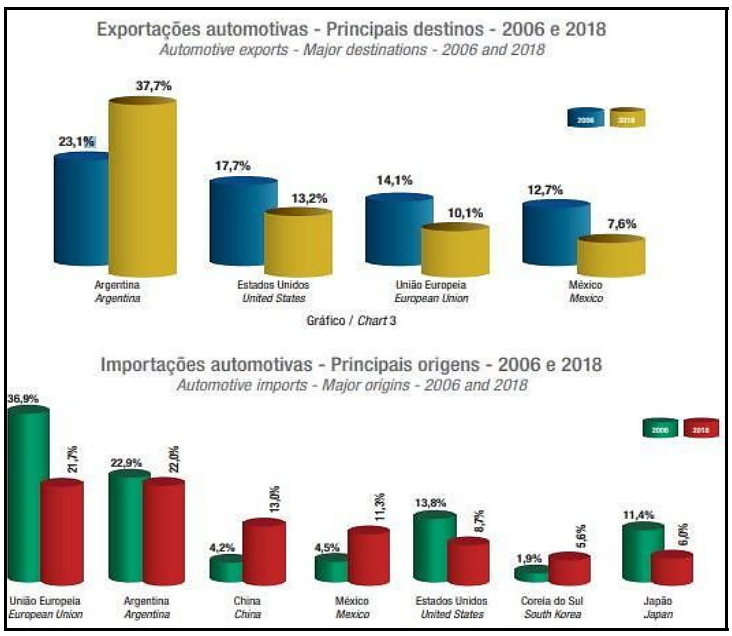
4.1.3 Brazilian Automotive Market

A decade after the Revolution of 1930, Getúlio Vargas, president of Brazil, in this period, inserted a new concept in government that would become a model that would start in 1956. The end of World War II, there was the beginning of the process to stimulate national automotive manufacturers. This period led to the creation of the GEIA (Executive Group of the Automotive Industry), a body formed to regulate the Brazilian automobile industry. At the end of 1940, Brazil maintained many cars from the 1930s as utilities, American and European trucks. When Juscelino Kubitschek, President of Brazil during this period, took office, the history of automobiles in Brazil became a new and prosperous market (Quatro Rodas, 2016).

Figure 1. General Motors concessionaire in the city of São Paulo in the 1930s. Only imported cars

Source. Quatro Rodas/Anfavea (2019).

The import of cars was stimulated again in 1990, through the opening of the Brazilian market. Import proceedings had been banned since 1976 and resumed again by the Collor government on 9 May 1990. In this period, inflation was accumulated at 1,782.90% in 1989 and approximately 760,000 cars were plated in Brazil. Autolatina, which was a merger between the Ford and Volkswagen brands, had a 55% market share, GM 28%, and Fiat 10% (O GLOBO, 2000).



Graph 1. Brazilian automotive exports and imports between 2006 and 2018

Source. Anfavea (2019).

According to graph 1, Brazil has slowed exports over the last few years, an analysis that defines the lack of technology that Brazil faces to the world's demand for energy efficiency in its cars, thus there is a need for vehicle imports.

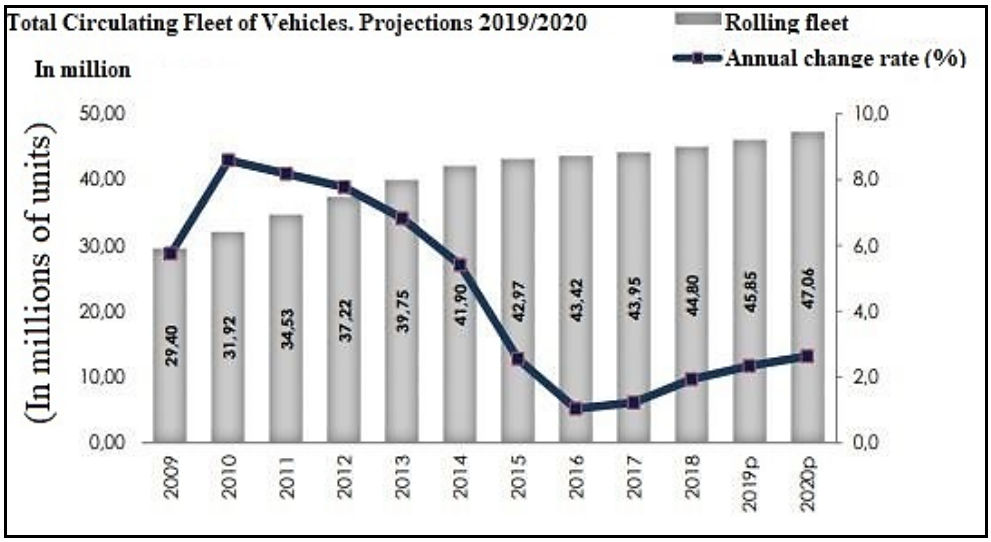
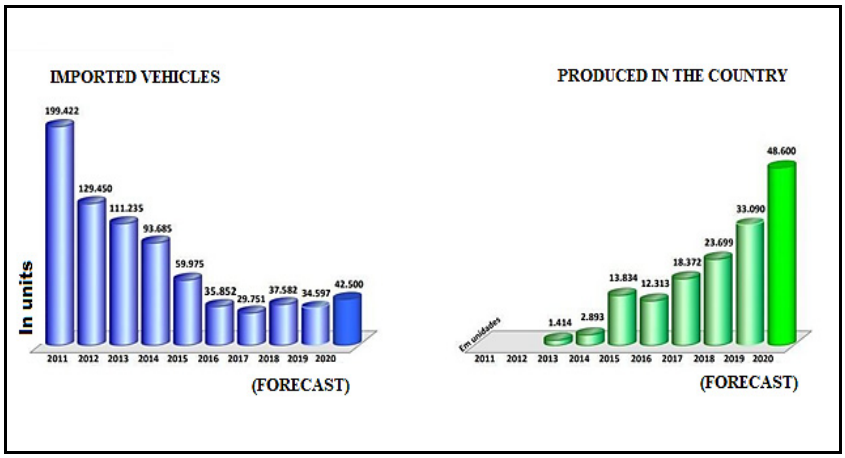


Figure 2. A circulating fleet of vehicles in Brazil

Source. Sindipeças (2019).

According to Figure 2, there is a growth projection for 2020 at about 2.5%. This scenario in Brazil is favorable to be able to evaluate with greater concern by environmental agencies, the replacement in the short and medium term of the number of vehicles in circulation powered by fossil fuel, those powered by electrical or hybrid systems. The use of electricity in electric car models would allow a reduction in gasoline consumption of 40.7% in 2031.

Thus, there will be a 27.5% reduction in total energy consumption about the national volume of cars, approximately 31.6 × 106 tep/year (BARAN, 2012). In Brazil, the automotive sector represents 22% of the industrial GDP with an important representation in the international market. Due to the branching that this sector exerts in other segments of the industry, there is a direct impact on the production chain. (MINISTRY OF ECONOMY, 2017).



Graph 3. Comparison between vehicles imported and produced in the country

Source. ABEIFA (2019).

Brazil has high tax costs and bureaucratic processes, known as Cost Brazil which results in a low level of competitiveness for exporters and for multinational investments to be able to settle in the country. In Graph 2 it is possible to identify the low level of national production when compared to the imported volume in the period 2015 and 2019.

4.1.4 Brazilian Government Strategy for the Sector

The Rota 2030 Mobility and Logistics Program is regulated by Law No. 13,755 of December 10, 2018, and is a program strategically created by the Federal Government for the development of the Brazilian automotive sector. This program replaces the predecessor that was the Inovar-Auto Program, completed on December 31, 2017 (Ministry of Economy, 2020).

Faced with the trends of urban mobility and global technological development, the Federal Government has obtained the initiative to stimulate Brazil to be able to obtain more effective participation in this sector, through the export of automotive component vehicles (MINISTRY OF ECONOMY, 2020). The Program also stimulates environmental sustainability and citizenship, policies to encourage technological research and strategies for companies, thus being able to become competitive and with progressive growth (Ministry of Economy, 2020).

Table 4. Sales and license slings 2012 to 2019

Sales/license slates of electric vehicles (Ves) in Brazil - 2012 to December 2019													
	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez	Total Ano
2012	9	16	7	3	13	23	5	3	2	2	18	16	117
2013	45	22	53	50	12	29	65	45	23	39	52	56	491
2014	93	61	65	53	94	52	61	79	71	53	87	86	855
2015	72	56	61	73	72	74	74	100	82	55	65	62	846
2016	58	64	60	137	41	91	48	59	79	93	159	202	1091
2017	178	157	227	176	208	238	268	627	384	243	240	350	3296
2018	272	254	367	367	302	382	262	262	286	405	374	437	3970
2019	370	287	336	290	357	716	960	867	1264	1989	2013	2409	11858
TOTAL													22524

As shown in Table 4, total sales from 2018 to 2019 grew by approximately 200%. This percentage reflects the Brazilian's search for sustainability, although the country has difficulty in the infrastructure for electric vehicle supplies. One of the objectives of the Rota 2030 Program is to provide the Brazilian industry with greater technological competitiveness, due to large companies that are multinationals established in Brazil, having their headquarters in other countries (Ministry of Economy).

In this way, the Rota 2030 Program has the challenge of solving deficiencies such as the lack of competitiveness of the Brazilian automotive sector in the international market, loss of investments in Brazil due to the disapproval of new projects by multinationals installed in the country, and the risk in the lack of monitoring the development of technologies related to biofuel (Ministry of Economy).

The Rota 2030 Program has the automotive sector as its target audience: automakers and vehicle importers, auto parts manufacturers, and workers in the sector; however, its results will be shared with society as a whole, especially through increased energy efficiency and safety of vehicles sold in the country (Ministry of Economy, 2020).

According to the publication Diário Oficial de União, Camex Resolution No. 97/2015 reduces the Import Tax rate for electric and fuel cell cars from 35% to zero. This change was made through the inclusion of code.703.90.00 of the Mercosur Common Nomenclature (NCM), in the List of Exceptions to the Common External Tariff. (Camex, 2015).

According to CAMEX (2015), this decision was carried out after analysis and the measure aims to insert Brazil into new technological routes, thus providing consumers with high energy efficiency vehicles with low fuel consumption, through the reduction of gases. pollutants.

The Camex Executive Management Committee (Gecex) reduced import tax rates for the categories of hybrid vehicles, models that have combustion engines, but that also work with auxiliary electric or pneumatic propulsion systems. The percentage of the tariff is established according to the energy efficiency category of each model manufactured (CAMEX, 2015).

Table 5. Reduction in % of IPI according to displacements

NCM	***Cylinders***	***Ability***	***Reduction II %***
8703.22.10	1.000 cm^3 > 1.500 cm^3	Up to 6 people	0, 2, 4, 5 e 7
8703.23.10	1.500 cm^3 > 3.000 cm^3	Up to 6 people	0, 2, 4, 5 e 7

Source. Prepared by the Academic based on data from the Ministry of Economy (2019).

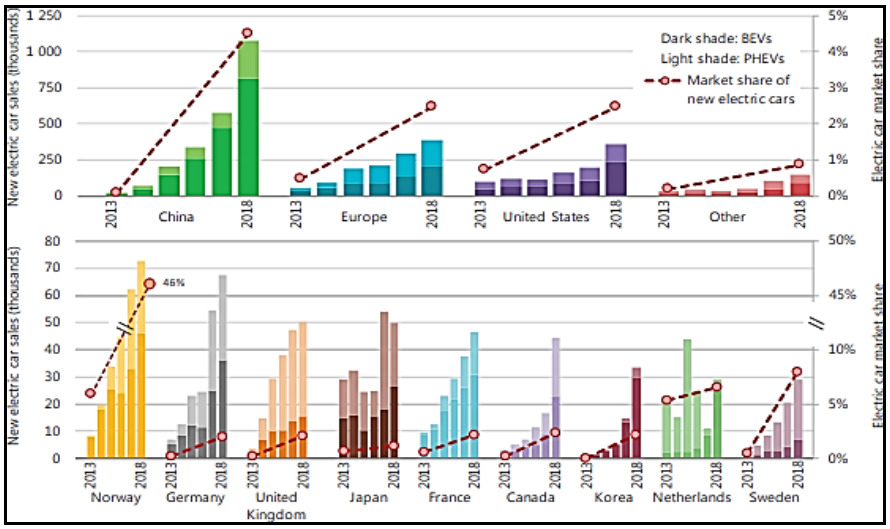
Table 5 shows the classification of cylinders according to the respective NCM, where in hybrid car models there is a reduction of II, according to their energy efficiency, although in the Brazilian market there is little incentive for commercialization when compared to other countries.

4.2 International Electric and Hybrid Car Market

Global electric vehicle sales in 2018 were approximately 2 million new cars, compared to 1 million in 2017. This growth represents 68% in electric car sales in this period (IEA, 2019, p 35). China occupies the position of the largest electric car market in the world, with approximately 1.1 million electric cars sold in 2018, with a global representation of 55% in the electric car market. (IEA, 2019, p. 35, our translation).

The increase in European electric car sales in 2018 was 31% compared to 2017, a lower growth compared to 2017 compared to 2016 with 41%, in addition to being below the global average. Sweden holds the third largest position with 7.9%. The United States saw an increase of 82% in 2018, growth above the global market average, and is the third largest market for electric cars (IEA, 2019, p. 35).

According to (IEA, 2019, p. 37, our translation), hybrid cars are produced with greater volume in large vehicle models, a characteristic analyzed in all markets. The main reasons are for having two propellers, an electric motor and another with, in this way they are more efficient for larger vehicles and greater autonomy for long distances.



Graph 3. Electric car sales and market share in the top ten countries

Source. IEA (2019).

Based on graph 3, it is possible to observe China with the largest share of the international market for electric cars (Battery Electric Vehicles, BEVs) and hybrids (Plug-in Hybrid Electric Vehicles, PHEVs), followed by Europe and the United States. In market share, Norway is the leader with 46%.

4.3 Difference between Hybrid and Electric Vehicles

Electric and hybrid cars have prominence in the international market due to their benefits for the quality of the environment, which reflects directly on society in a positive way. Hybrid

vehicles have combustion engines designed to only charge batteries or be responsible for compensating for the traction of vehicles and work with the electric motor simultaneously, in addition to charging batteries (IEA, 2019).

These models use an energy regeneration system through braking and when it is in motion by the engine itself with combustion, a model that has no plugins (outlet). Electric vehicles work only with 100% electric engines, whose energy is stored in batteries and the model has a plugin (outlet) that is usually located on the front of the vehicle to perform charging in residential and public stations (IEA, 2019).

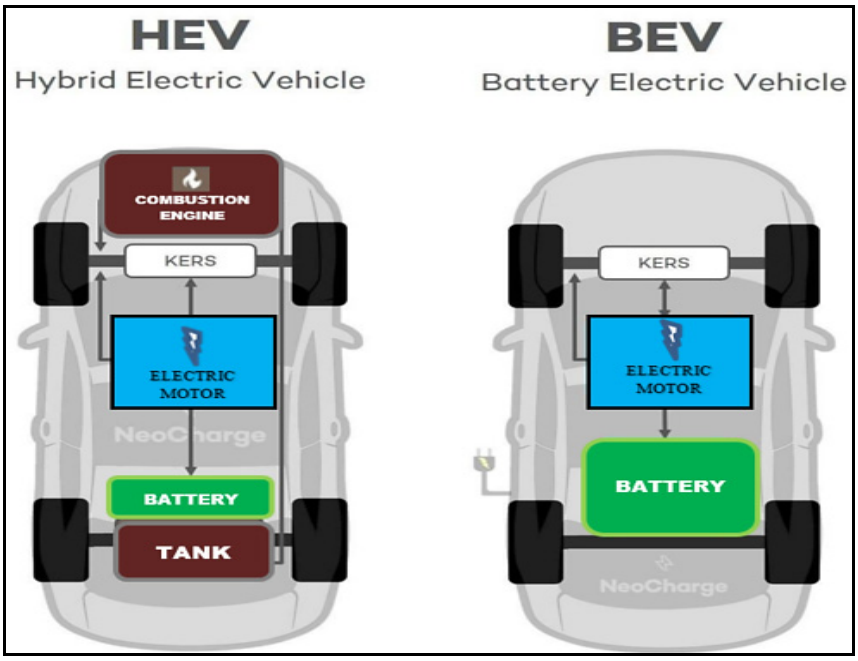


Figure 3. Illustration of the difference between hybrid and electric models

Source. NEOCHARGE.

In Figure 3, it is possible to observe the Kers mechanism which are regenerative braking systems that accumulate energy through braking, thus saving energy. (AUTOMOTIVE IQ, 2019).

Table 6. Comparison of electric and hybrid model

Parameter	***Electric vehicle***	***Hybrid Vehicle***
Load	Necessary	Not required
Fuel use	No	40% a 60% of combustion vehicles
Public chargers in Brazil	Low	High
Issuance of CO_2	Low	High
Average Vehicle Price	High	Similar to combustion vehicles
Motorization	Electric	Combustion + Electric

Source. Model adapted by the academic based on the INC 42 table.

According to INC 42 (2019), hybrid cars are not more fuel efficient than electric vehicles, but compared to gasoline or diesel vehicles, hybrid cars are better at about 20% to 30% fuel efficiency and can have an average range of 48 to 60 miles per gallon.

4.4 Benefits of Vehicles with Electric Thrusters

These vehicle models have environmental, social, and health benefits according to the International Energy Agency (International Energy Agency, 2019), and:

Energy efficiency: electric vehicles are three to five times more energy efficient than vehicles with combustion engines;

Energy security: electric mobility increases the energy security of the road transport sector, which has a strong dependence on fossil fuels, in addition to reducing dependence on oil imports in several countries;

Air pollution: 0% emission of toxic gases through exhausts helps especially in urban areas and along highways where large numbers of people are exposed to harmful pollutants from road transport vehicles;

Greenhouse Gas Emissions: the increase in electric mobility associated with a progressive increase in the generation of low-carbon electricity provides significant reductions in GHG emissions from road transport about vehicles that have combustion engines. Electric vehicles can develop an extension of the renewable source of energy, that is, be used as an energy supply base;

Noise reduction: electric vehicles are quieter than vehicles with combustion engines;

Industrial development: they are important for the industrial sector due to the incentive for improvements in the manufacture of batteries, to increase competitiveness in the market, and to strengthen the propagation of this clean energy sector.

Electric and hybrid vehicle models that have plug-ins (sockets) can be charged in homes, thus optimizing time and avoiding queues at gas stations. Another advantage is the components that are produced with lighter materials, in addition to being equipped with fewer parts compared to vehicles with combustion engines.

Hybrid models are more suitable in countries where the infrastructure to meet 100% electric vehicles is deficient, as they have two engines, electric and combustion, the autonomy of kilometers traveled is greater and are more used in models of medium and large vehicles. . In this way, they are suitable for the road transport sector.

Norway's electric cars directly compete with combustion vehicles on the purchase price, where the electric vehicle fleet is larger than combustion vehicles, due to the stimulus tax incentives that the government provides. (POD POINT, 2020).

In this way, the import processes in Brazil are essential to boost the entry of new clean energy vehicles, and individuals can carry out the processes in addition to the companies that import to the market, so the final cost for acquisition becomes higher by the insertion of the value of resale. In the next chapter, the steps in the import process will be demonstrated.

4.5 Steps in the Import Process

In this chapter, the steps in the import process as an individual, the respective documents wrapped, and the costs of the operation will be covered.

4.5.1 Tax Classification

The consultation on the fiscal classification of goods is the first step to start the import process, as the importer will check the fiscal classification of the goods in the Mercosur Common Nomenclature (NCM) and that in the Common External Tariff (TEC) and Incidence Table of the Tax on Industrialized Products (TIPI) (RECEITA FEDERAL, 2015).

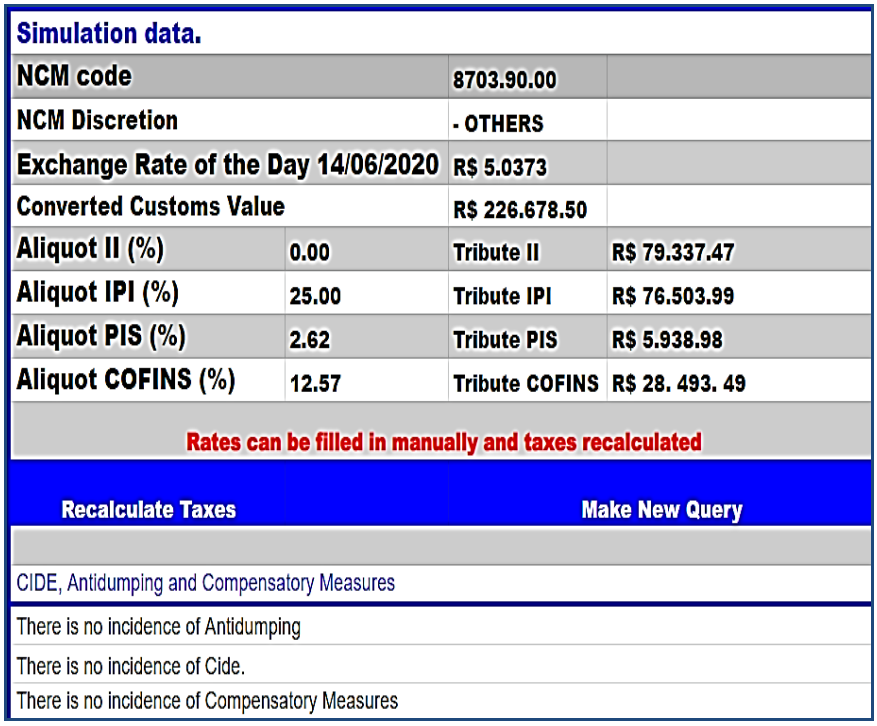
The fiscal classification of goods is regulated by the General Rules for the Interpretation of the Harmonized System (RGI/SH) of the International Convention on the Harmonized System of Designation and Coding of Goods, in the General Complementary Rules of Mercosur (RGC), in the General Rules Complementary to the TIPI (RGC/TIPI), in the classification opinions of the Harmonized System Committee of the World Customs Organization (WCO) and Mercosur's dictates, and, secondarily, in the Explanatory Notes of the Harmonized System (NESH). In addition, the classifications of goods contained in the OMA Opinions, translated and internalized by an act of the Secretary of the Federal Revenue of Brazil, according to Normative Opinion No. 6, of December 20, 2018, are binding.

When correctly identified the NCM, it will be possible to verify the type of product according to the current taxation, when applicable. In case of the stowage tax classification with an NCM that does not correspond correctly, it will result in fines, and loss of benefits or the goods may be returned.

4.5.2 Administrative Treatment

The Administrative Treatment of import is an analysis of all the procedures that the goods will be submitted in the process. Starts in the Tax Classification (NCM) correctly, thus there is the analysis of the requirements by the ancient bodies and SECEX.

In the simulation of Figure 3, NCM 87039000 is used, according to Camex resolution no. 97/2015, reduces to 0% the import tax rate for electric vehicles and fuel cell-powered vehicles.

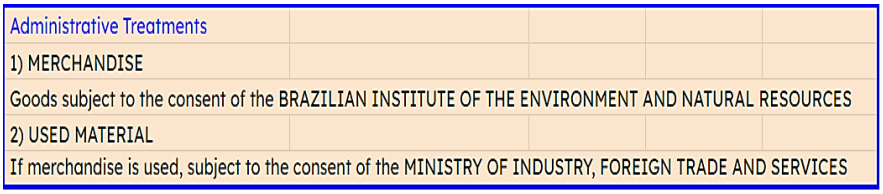


Simulation data.			
NCM code		8703.90.00	
NCM Discretion		- OTHERS	
Exchange Rate of the Day 14/06/2020		R$ 5.0373	
Converted Customs Value		R$ 226.678.50	
Aliquot II (%)	0.00	Tribute II	R$ 79.337.47
Aliquot IPI (%)	25.00	Tribute IPI	R$ 76.503.99
Aliquot PIS (%)	2.62	Tribute PIS	R$ 5.938.98
Aliquot COFINS (%)	12.57	Tribute COFINS	R$ 28. 493. 49
Rates can be filled in manually and taxes recalculated			
Recalculate Taxes		Make New Query	
CIDE, Antidumping and Compensatory Measures			
There is no incidence of Antidumping			
There is no incidence of Cide.			
There is no incidence of Compensatory Measures			

Figure 4. Simulation of Tax and Administrative Treatment of Imports

Source. Internal Revenue Service (2020).

According to Figure 4, the student body in this case is the Institute of the Environment and Natural Resources (IBAMA).



Administrative Treatments
1) MERCHANDISE
Goods subject to the consent of the BRAZILIAN INSTITUTE OF THE ENVIRONMENT AND NATURAL RESOURCES
2) USED MATERIAL
If merchandise is used, subject to the consent of the MINISTRY OF INDUSTRY, FOREIGN TRADE AND SERVICES

Figure 5. Simulation of Tax and Administrative Treatment of Imports

Source. Internal Revenue Service (2020).

For the tax and administrative treatment of hybrid vehicles, ncm.703.22.10 and 8703.23.10 are used and will be according to the energy efficiency specification of the model that will be imported (CAMEX, 2020).

4.6 Import License

The Import License is an electronic document generated by the importer through SISCOMEX, containing information on both the goods and the operation. This document becomes necessary depending on the type of product that will be imported and must be obtained through the

authorization of one or more consenting bodies. The average period for granting is on average 15 days after your request (Governo Do Brasil, 2019).

The importer as an individual who is, for example, in a process where the product is a vehicle, must request an Import License from Siscomex, which will be analyzed and approved. Simultaneously with the registration of the LI, a certified copy of the Certificate to the National Traffic Legislation must be sent to Suext (Subsecretary of Foreign Trade Operations), through a branch of Banco do Brasil. (Cabral; Cangussu, 2011).

SECEX Ordinance No. 23, of July 14, 2011, where the administrative treatment is regulated, defines the following import modalities:

Non-Automatic Licensing: it is according to the licensing of merchandise or import operation in some cases and with merchandise already imported, in which the rejection is by Siscomex through the Import License (LI);

Automatic Licensing: according to the goods already imported and available for customs clearance by the importer, in which Siscomex is used to formalize the licensing through the Import License (LI); and;

Licensing Waivers: according to the list of products and operations in which the federal government does not intervene when evaluating the import process, where the importer issues the Import Declaration (DI) when the goods are in the country and the analysis is carried out by the Internal Revenue Service (SRF) or customs authority.

4.6.1 Qualification of the Importer (Individual)

The importation of a vehicle by an individual may be carried out only in a quantity that does not characterize the marketing and which is customary. (RECEITA FEDERAL, 2020). In this system, the intervening agencies such as the Brazilian Federal Revenue Office, responsible for customs and tax areas, and the Central Bank of Brazil in the financial and foreign exchange areas have access and thus optimize bureaucratic procedures in the import and export processes. It is also possible to analyze statistical data on foreign trade, used to control access to foreign trade systems by importers, exporters, and intervening bodies (Receita Federal, 2019).

The application for the qualification of an individual must be carried out by the Digital Attendance Dossier (DDA) and presented in any unit of the RFB. During this stage of the process, the applicant must elect a customs broker as his legal representative for foreign trade operations (Receita Federal, 2020).

	QUALIFICATION IN FOREIGN TRADE		
	LIST OF DOCUMENTS - TYPE - INDIVIDUAL	LEGAL BASE	✓
0	The qualification of the individual will be requested through an application to be presented at any RFB unit. The application must be accompanied by the following documents:	Art. 8º da IN RFB n.º1.603/2015	
1	Copy of identification document **with photo**:	Art. 8º "I" IN RFB n.º 1.603/2015	
2	Representative's power of attorney (**power of attorney**) and copy of his/her identification document, **when applicable**:	Art. 8º "II" IN RFB n.º 1.603/2015	
3	Rural producer's invoice, **when applicable**:	Art. 8º "III" IN RFB n.º 1.603/2015	
4	Copy of artisan's license, **when applicable**:	Art. 8º "IV" IN RFB n.º 1.603/2015	

Figure 5. List of documents for personal qualification

Source. Internal Revenue Service (2015).

In Figure 5, it is possible to verify the documents necessary for the qualification of an individual according to the legal basis in force for each document, in this way it is possible to check in detail the regulations according to the requirements of the Internal Revenue Service. In international trade, each stage of the process comprises a document to be able to follow up the procedures correctly, so the verification and knowledge of each one are extremely important for the realization of the process.

4.7 Commercial Invoice

The commercial invoice is the contractual document of a purchase and sale transaction between the importer and the exporter. This document must include all the information that corresponds to the negotiation, such as the characteristics of the products, the payment terms and currency used, the country of origin and destination, the purchase and sale conditions according to the international terms of trade (RECEITA FEDERAL, 2020).

The commercial invoice has a characteristic of the Import Declaration (DI). the original document is presented; the customs clearance process will be interrupted.

Article 557 of the Customs Regulation provides all the information that must be included in the commercial invoice, which are: name and full address of the importer and exporter, specifications of the goods, quantity, and type of volumes, gross weight, net weight, country of origin, country of acquisition, unit price, freight value, payment condition and currency and finally the sales condition term (INCOTERM).

4.8 Knowledge of Embarkation

The bill of lading is a document issued by the carrier, which has the definition of contracting the operation in international transport, confirming receipt of the goods at origin and mandatory delivery at their destination, in addition to having the characteristic of ownership of the goods and description of the transport operation. (Federal Revenue, 2014).

This is the main document, used in international transport, which contains all the information

regarding the goods and is usually issued in 6 (six) copies, where 3 (three) negotiable bills of lading and (three) copies (nonnegotiable bills of lading) and filling in the information is carried out on the back of the document, such as bill number, date of issue, name, and travel of the ship, shipper, depositary, name of the person in charge who will be notified when the goods arrive at your destination and its general characteristics (quantity, gross weight, packaging, brands, volumes, freight payment method if it is prepaid or collects, freight value, name of the carrier at the port of shipment, destination and transshipment. (Martins, 2008).

Different types of bill of lading classification can be verified and these are linked according to the issuer and consignee of the transport. According to the Federal Revenue of Brazil (2014), the bill of lading is classified as:

● Only modality issued by the carrier (shipping agency, shipowner) and when the consignee is not a deconsolidation agent;

● Generic or master: modality issued by the carrier (shipping agency, shipowner) and when the consignee is deconsolidation;

● Sub-master or co-loader: modality in which it is issued by the cargo consolidator agent and the consignee is another cargo deconsolidation agent.

By Article 744 of Law No. 10,406 of January 10, 2002, the bill of lading must be issued with the force of a public deed, under Article 575 of the Civil Code. For the importer, the presentation of the bill of lading is valid for the removal of the goods deposited in the customs warehouse, according to item IV of art. 54 of IN SRF No. 680, of October 5, 2006. (RECEITA FEDERAL, 2014).

4.8.1 Romaneio (Packing List)

The packing list or packing list as internationally known is the shipping document with the description of all the goods shipped or components of a load according to the amount that is fractioned. The purpose of this document is to detail the characteristics of the goods the identification and location of a product in a batch and to facilitate inspection during loading and unloading (Receita Federal, 2014).

Its purpose is to make known in detail how the goods are presented, to facilitate the identification and location of any product within a batch, in addition, to facilitate the inspection of the goods by the inspection, both during loading and unloading. There is no standard template for this document. The information that integrates the document is the total quantity of volumes or packages, marking of the volumes, identification of the volumes in numerical order; type of packaging (boxes, pallets, bottles, etc.) with net weight, gross weight, unit dimensions and the total volume of the load (Receita Federal, 2014).

Article 553 of the Customs Regulation mentions the requirement to present the packing list and that the import declaration is instructed by this document when applicable.

4.8.2 Certificate of Origin

The Certificate of Origin is a document that allows proof of the imported goods in compliance

with the requirements at origin for each agreement established between the countries involved. In this way, importers and exporters can benefit from tax reductions and exemptions in international agreements in which they are developed between countries and economic blocs, in addition to the merchandise, increasing their competitiveness in the market. The SRF Normative Instruction No. 1864/2018 contains the procedures for the treatment of the preferential tariff regime (Ministry of Economy, 2020).

The rules of origin are classified as Preferential Norms of Origin, negotiable regulations between the signatories of preferential trade agreements, and have the main objective of ensuring preferential treatment will be limited to products that refer only to the countries that signed the agreement and Norms of Non-Preferred Origin they are laws, regulations and administrative determinations with general application to classify the country that originated the goods (Ministry of Economy, 2020).

4.8.3 License for the Use of Vehicle or Engine Configuration – LCVM

The vehicles which they are imported into Brazil need to meet the same levels of pollutant and noise emissions that are established for Brazilian vehicles. According to Law No. 8,723/93, all vehicles imported must follow the same standards as vehicles manufactured in Brazil.

This process follows the Program for The Control of Air Pollution by Motor Vehicles (PROCONVE). This program was prepared by the National Council of the Environment (Conama), with Resolutions, guidelines, deadlines, and legal standards for the emission of considerable gases to the different models of imported and national vehicles. (PROCONVE, 2011). Thus, the importer should consult ibama Normative Instruction No. 11 of 25.07.2014, in which he advises on obtaining the License for the Use of Vehicle or Motorcycle Configuration, which is provided for in IBAMA Ordinance No. 86/1996, Article 4.

4.8.4 Certification to National Traffic Legislation - CAT

The National Traffic Legislation Certificate (CAT) is a document that was created to meet the proof of vehicle safety by manufacturers, transformers, assemblers, or importers (JUSBRASIL, 2020). This document is issued by the National Traffic Department (Denatran) and has information such as the model, vehicle version, and make. In this way, it will prove by tests and technical specifications required by Denatran that approval has been carried out for the vehicle to be marketed and registered in the National Registry of Motor Vehicles (RENAVAM). (Legisweb, 2009).

Under Article 103 of Law No. 9,503 of September 23, 1997, it will be possible to use the vehicle that meets the safety requirements and specifications established in this code and norms of the National Traffic Council (Contran).

In imports by individuals or legal entities, when there is no link with the manufacturer or its commercial representative, the CAT issued is restricted to the vehicle according to the vehicle identification number, in addition to the import process having the following limitations: vehicles of 4 (four) or more wheels: 2 (two) units of the same brand, model and version with a maximum of 20 (twenty) units per importer annually. Vehicles with 2 (two) or 3 (three) wheels

can be imported with 50 (fifty) units of the same make, model, and version with a maximum of 100 (one hundred) units per importer per year, according to DENATRAN ordinance no. 190 of June 29, 2009 (Legisweb, 2009).

4.8.5 Exchange Agreement

The exchange agreement is the instrument signed between the seller and the buyer of foreign currencies and mentioned all the characteristics of the exchange transaction and conditions (CENTRAL BANK, 2012). The payment of the import must be made through the conclusion of an exchange contract by an institution authorized by the Central Bank, and the transaction data will be recorded in the SISBACEN (Integrated System to the Central Bank).

Foreign exchange transactions are formalized using an exchange agreement and their data must be recorded in the Integrated Exchange TransactionS Registration System (Exchange System), according to the provisions of section 2 of Chapter 3, and the date of registration of the exchange agreement in the Exchange System must correspond to the day of the conclusion of said contract, Circular No. 3,591 of 2 May 2012.

4.8.6 Customs Clearance

The customs clearance process is a procedure that verifies the information that is declared by the importer according to the characteristics of the goods and related documentation, by article 542 of the Customs Regulation. Any merchandise that comes from abroad must be submitted for import clearance, which will be carried out based on a declaration presented to the customs unit under whose control the merchandise is (RECEITA FEDERAL, 2014).

Import clearance must start within 90 days of unloading in case the goods are in a bonded warehouse in a primary zone, according to article 546 of the Customs Regulation.

The customs clearance process on importation is carried out concerning the declaration presented. The declaration will be processed at Siscomex through the Import Declaration (DI), Single Import Declaration (Dump), or Simplified Import Declaration (electronic DSI). There are exceptions according to the characteristics of the merchandise, operation, and profile of the importer, where the import dispatch will be without registration in Siscomex by Simplified Import Declaration (DSI). (FEDERAL REVENUE, 2014).

4.8.7 Taxes in the Import Process

The taxes that are applied in Brazilian foreign trade operations are contributions, fees, and taxes. In import processes, the Tax on Industrialized Products (IPI), Import Tax (II), PIS/Pasep, Cofins, Tax on the Circulation of Goods and Services (ICMS), and Additional Freight for Renewal of the Merchant Marine (AFRMM) apply (SOUSA, 2010).

Payments of federal contributions and taxes on import operations amounts by antidumping, countervailing, and safeguarding rights, are made at the time of registration of the DI or in the rectification, through the Documento de Arrecadação de Receitas Federal (DARF), after payment is authorized bank agency accredited in the network of federal revenue collectors, under Article 11 of SRF Normative Instruction No. 680, of October 2, 2006.

4.9 Import Tax - II

Import Tax (II) is levied on foreign goods, such as travelers' luggage and goods that enter Brazil as gifts and samples. To calculate the tax, the entry of the goods into the customs territory and on the date of registration of the declaration is considered a taxable event (Invest & Export Brasil, 2020).

In import operations, it is possible to benefit from reduced rates of II according to the classified product, by international agreements between countries. In this way, for the importer to benefit, the Certificate of Origin must be issued by the exporter, later the importer needs to present the customs to prove the possible benefit. (Martins, 2008).

For electric and fuel cell vehicles, according to Camex Resolution No. 97/2015, the Import Tax rate was reduced to 0%, through the inclusion of code.703.90.00 of the Mercosur Common Nomenclature (NCM), in the List of Exceptions to the Common External Tariff (LETEC).

4.10 Industrialized Products Tax - IPI

The Tax on Industrialized Products (IPI) has an impact on industrialized products and the generating fact in the import process is the customs clearance of a product of foreign origin. For the calculation, the basis is considered the customs value of the goods, plus the value of the Import Tax. The verification of IPI rates in import processes is available in the IPI Incidence Table (TIPI), according to Decree No. 6,006 of December 28, 2006 (Invest & Export Brasil, 2020). The IPI is collected at the time of registration of the Import Declaration and is regulated by Decree No. 4,544 of December 26, 2002.

4.11 PIS/PASEP e Cofins

Law No. 10,865, of April 30, 2004, establishes the Programs for Social Integration and Formation of the Assets of the Public Servant incident in the Import of Foreign Products or Services (PIS/PASEP) and the Social Contribution for the Financing of Social Security due by the Importer of Foreign Goods or Foreign Services (COFINS) for the contribution. In the process of importing goods, the hypotheses of incidence of the Generating Fact and the date of occurrence of the Generating Factor of contributions are the same as those observed for the Import Tax. The calculation basis is the customs value plus the value of the ICMS, in addition to the value of the contributions themselves. (INVEST & EXPORT BRASIL, 2020).

4.12 Additional Freight for Merchant Navy Renewal – AFRMM

The Merchant Navy Renewal Freight Additional (AFRMM) is a contribution destined to the burden that the merchant navy and the Brazilian shipbuilding and ship repair industry have for its development and technological evolution. The AFRMM if its generating event is affected at the time of the unloading operation of the vessel in a Brazilian port. The calculation is made on the remuneration of waterway transport, at the rates of 25% in long-haul navigation, 10% in cabotage navigation, and 40% in river and lake navigation in the transport of liquid bulk in the North and Northeast regions (IRS, 2015).

4.13 Tax on Circulation of Goods and Services – ICMS

The Tax on Circulation of Goods and Services (ICMS) is a state-of-the-year tax on the movement of products in the domestic market and on interstate and inter-municipal transportation and communication services. This tax also focuses on imported goods, in general, to promote isonomic tax treatment for imported and domestic products. The ICMS is also a non-cumulative tax, and the amount paid at the time of importation is credited by the importer for compensation with the tax due on operations that he subsequently performs and that are subject to that tax. The ICMS rate is according to the legislation of each Brazilian state and the Federal District, where it ranges from 18% as normal, 25% as superfluous, 12%, and 0% for a tax benefit (MARTINS, 2008).

4.14 Siscomex Utilization Fee

The Siscomex Utilization Fee has a cost to stay in operation in addition to investments and thus there is a charge amount for each system user. This collection is regulated by Article 306 of Decree No. 6,759 of 2009. The amounts are available in Ordinance MF No. 257 of May 20, 2011 (IRS, 2020). According to Normative Instruction RFB No. 1158, of May 24, 2011, the utilization fee is due at the time of registration of the Import Declaration.

4.15 Import Cost

The cost sheet elaborated in Figure 6 is a simulation of the import of an electric vehicle with a 0% benefit in the Import Tax, corresponding with its energy efficiency and according to the Tax Incidence Table on Industrialized Products (TIPI).

INCOTERM		FOB
EXCHANGE RATE		5,3639
SHIPPING IN DOLLAR		$1.250,00
INSURANCE IN DOLLAR		$65,00
CAR IN DOLLAR		$42.000,00
TOTAL IN DOLLAR		$43.315,00
CUSTOMS VALUE OF DI IN REAL		R$ 232.337,33
Calculation of II / IPI / ICMS / PIS / COFINS	**Aliquots**	**Values**
CIF Value of Addition	0,00%	R$ 232.337,33
II	0,00%	R$ 0,00
IPI Calculation Basis		R$ 232.337,33
IPI		R$ 20.910,36
ICMS Calculation Basis		R$ 288.786,81
ICMS		R$ 519,82
PIS Calculation Basis		R$ 232.551,83
PIS		R$ 6.092,86
COFINS Calculation Basis		R$ 232.551,83
AFFRM		R$ 312,50
COFINS		R$ 29.231,76
SISCOMEX RATE		R$ 214,50
Customs Expenses of Nationalization		R$ 1.770,00
TOTAL COST.....		R$ 291.389,13

Figure 6. Estimated costs in an Import process

Source. Model adapted by the academic based on the spreadsheet of SISCOMEX EASY and IRS (2014).

The incidence of several taxes for the calculation base in the import process, according to Figure 6, is one of the obstacles that Brazilian importers have for the development of sectors that need technology, thus investing in the clean energy sector, specifically in urban mobility.

5. Final Considerations

In this research, the subject was the importation of hybrid and electric cars for individuals, a process little practiced in the Brazilian market and a trend for Brazil.

Through this research, it was possible to identify a deficiency in the urban mobility sector with clean energy in Brazil. The lack of a greater number of government incentive projects and for the technological development of industries, in addition to tariff barriers in the import process, are the biggest aggravating factors for Brazil to evolve in the commercialization of hybrid and electric cars both in the national and International.

Due to the commented scenario, there was an interest in analyzing the process for importing vehicles with more energy-efficient propellants, thus developing an incentive in this sector.

This research aimed to describe the procedures for importing hybrid and electric cars by individuals in Brazil, with emphasis on the national market for this segment in the country and the world.

To achieve the first objective, the national and international automotive market and the consenting bodies in which they are related to the import process were analyzed. In this research, it was possible to evaluate the participation of Brazil in the international and national markets regarding the commercialization of hybrid and electric vehicles. South America, compared to other continents, basically corresponds with low participation in international statistical data which are related to the commercialization of vehicles with greater energy efficiency. Thus, to meet the second objective, a survey was carried out to highlight the steps in the process of importing electric and hybrid vehicles for individuals. To develop the search for this information, the various consenting and intervening bodies were consulted.

Vehicles have specific procedures to be imported, such as the issuance of the LCVM, a document issued by IBAMA, which is related to the quality of the emission of polluting gases and noise. It was evaluated that there is a reduction in the tax collection according to the energy efficiency of hybrid vehicle models, from 0%, 2%, 4%, 5%, and up to 7%.

For the third objective to be met, a survey was carried out to highlight the import process of the documents and taxes involved. For an individual to start the import process, it is initially necessary to register in SISCOMEX, a step in which the importer's profile is evaluated. It was also evaluated that the Commercial Invoice is the first stage in the negotiation for the purchase and sale of a product in foreign trade.

The Commercial Invoice contains numerous information such as the data of the importer and exporter, description of the goods, terms of negotiation, and all the detailed information that are available in Article 557 of the Customs Regulation.

In this way, this research highlighted the need for investments in urban mobility through

vehicles with clean energy sources, in addition to proving the low participation of Brazil in the international market in the commercialization of electric and hybrid vehicles.

This project provided the academic with knowledge regarding the steps for an individual to develop an import process, understand the various documents in which they are involved during the process, evaluate Brazil's participation in the world market, the commercialization of vehicles, identify a literature deficiency for research and create business opportunities for academics in the urban mobility sector with a focus on importing vehicles that have electric power propellers.

For the academic, this research is recommended to serve as a basis for future projects and to deepen the topic related to the process of importing individuals for vehicles from renewable sources, as well as deepening the assessment of the environmental impact that Brazil may have with the replacement vehicle fleet from engines that use fossil fuels to those powered by renewable energy sources.

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