

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



**Diploma Thesis**

**Referendum on the independence of New Caledonia  
and implications for nickel production**

**Bc. Pavel Mráz, MSc.**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Bc. Pavel Mráz, MSc.

Economics and Management

### Thesis title

Referendum on the independence of New Caledonia and implications for nickel production

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### Objectives of thesis

Evaluate the economic situation of New Caledonia. Focus primarily on the extraction of nickel and its impact on the environment to demonstrate the interdependence between nickel production and the referendum on the independence, which took place in November 2018. Determine political organization of the country, introduce institutions of New Caledonia and especially define its degree of autonomy. Discuss current issues of independence, based on an analysis of all relevant information. Analyze the results of the referendum and find perspectives of a future political and economical direction of a country.

### Methodology

Literature review will utilize analysis, synthesis, induction, deduction, analogy and comparison.

Analytical part will use both main methods. Qualitative method will describe position of main minorities and their influence in heterogeneous society. Quantitative research will examine people's views on the question of full independence and predict the result of the referendum.

**The proposed extent of the thesis**

60 – 80 pages

**Keywords**

French overseas territory, Pacific ocean, nickel mining, referendum of independence, Kanaks

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**Recommended information sources**

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## **Declaration**

I declare that I worked on my diploma thesis titled "Referendum on the independence of New Caledonia and implications for nickel production" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any third person.

In Prague on the 29<sup>th</sup> November 2018

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Bc. Pavel Mráz, MSc.

## **Acknowledgement**

I would like to thank to all my colleagues, who were supporting me to finish this Diploma thesis on time and especially to me advisor Ing. Petr Procházka, MSc. PhD., for his support during my work on this thesis.

## **Referendum on the independence of New Caledonia and implications for nickel production**

**Summary:** This thesis deals with the extraction of nickel in New Caledonia. It describes its production history, the current economic situation, but also presents in details the major players on Caledonian market with this raw material. All this is put into context not only from the environmental perspective, but it also demonstrates the indissoluble connection between the mining of nickel and the economic or political perspectives of New Caledonia.

New Caledonia, which is still a French overseas territory with the status *sui generis*, is just after the referendum on its self-determination. The aim of this work is best evaluation of all available information to predict the possible future economical and political direction of the country after the referendum, which took place in November 2018.

**Key words:** French overseas territory, Pacific Ocean, nickel mining, referendum of independence, Kanaks

## **Referendum o nezávislosti Nové Kaledonie a jeho důsledky pro produkci niklu**

**Souhrn:** Tato diplomová práce se zabývá těžbou niklu v Nové Kaledonii. Popisuje její produkci historii, současnou ekonomickou situaci, ale také podrobně představuje hlavní aktéry na kaledonském trhu s touto nerostnou surovinou. To vše je dáno do kontextu nejen z environmentální perspektivy, ale také ukazuje nerozlučitelnou spjatost těžby niklu s ekonomickou a politickou situací v Nové Kaledonii.

Nová Kaledonie, která je stále francouzským zámořským územím se statutem sui generis, se právě nachází v období těsně po referendu o svém sebeurčení. Cílem této práce je nejlépe vyhodnotit všechny dostupné informace k předpovězení možného budoucího ekonomicko-politického směřování země po referendu, které se konalo v listopadu roku 2018.

**Klíčová slova:** Francouzské zámořské území, Tichý oceán, těžba niklu, referendum o nezávislosti, Kanakové

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# 1. Introduction

Author writes this Diploma thesis on the topic: Referendum on the independence of New Caledonia and implications for nickel production. New Caledonia is very interesting uncommon country, not only within French overseas territories, but also within Pacific countries. New Caledonia since the late 80s of the 20th century undergoing a broad of political transformation. Despite of a number of significant features of exclusive powers, New Caledonia is still part of French overseas territories. Already now the situation may change. In New Caledonia will be a referendum on self-determination of New Caledonia, in which its residents can choose between independence or remain in the framework of the French overseas territories. New Caledonia is a very unique country, not only in the political grouping of the French Republic, but also throughout Oceania.

New Caledonia has the largest degree of autonomy of all French overseas territories. It belongs to the community *sui generis*-and has a special head in the French Constitution. We can say that New Caledonia is on the third stage in the process of autonomy. The question is, if exiting whether the degree of autonomy of New Caledonia is already sufficient, and whether it has real meaning to become a fully independent state.

It is necessary to mention the economic situation and the economic potential of the country, which is the area of the Pacific Ocean very above average. New Caledonia is one of the richest countries in the Pacific because of its mineral resources. Nickel is the only one major pillar of Caledonian economy and the economical results of nickel mining industry influence a lot a course of Caledonian well-being.

In New Caledonia, there are up to 25% of the world's known reserves of nickel, which give the country great economic potential in the coming decades. On the other hand, it's a one-way economic focus is entirely dependent on the evolution of nickel prices on the world markets. Nowadays the nickel price is on very low level and it can influence the whole economy. This thesis explains the relationship between economy of New Caledonia and nickel mining and processing sector.

## **2. Objectives and Methodology**

### **2.1 Objectives**

In the theoretical part of the thesis, the author will focus on New Caledonia. First, begin with a brief introduction geography of New Caledonia, which is an important link to understanding its geopolitical situation. New Caledonia is precisely because of its geographic position, an important strategic area in the whole Pacific. Thus it is focusing on its history, which is key to understanding the relevant facts of its gradual political development.

The author will also focus on the nickel process of a production, the environment impacts or on the present situation on the world market, but also on a historical background of nickel mining. One part will be devoted to introduction of Caledonian main processing companies and their economical results and center on cooperation between public and private sector or redistribution of profits.

Further, it will pay the political organization of New Caledonia and presents all important political institutions of the country and their rights and obligations, including the important division of powers between the institutions of New Caledonia and France.

In the analytical part of the thesis, author will make deeper look inside world nickel production and analyze the influence of New Caledonia on the world nickel market. Author will measure a correlation between prices of industrial metals to see, how much they are influencing each other. Regression analysis will be made to see the impact of the referendum on the nickel price.

An integral part is also taking into account important factors such as relationships between local communities. New Caledonia is a very diverse country in which live amounts of communities that occupy the question of independence different attitudes. The attitudes of the communities author analyzes with regard to their status in society. Their opinions into account and in your research. Finally, based on an analysis of all relevant information, the author will address current issues of independence, which will be a question of a referendum.

## 2.2 Hypothesis and research questions

The main aim of the author of the thesis is the prediction of the outcome of the referendum. Claiming that: **“New Caledonia will remain a part of the French overseas territories after the referendum, which will result in a decrease in the price of nickel on world markets”**, is the hypothesis that the author will explore in his work. Based on the results of research and survey that the author himself has performed during his stay in New Caledonia between its inhabitants, author is going to answer research questions and to try to predict a future nickel price development after the referendum and thus confirm or refute a working hypothesis.

The author will examine in this thesis the influence between nickel mining and the question of readiness for independence:

*How can the movements of nickel price on the world market influence behaviour of different actors as nickel producers, Caledonian institutions, people employed in nickel industry or of French metropolitan government? Is the nickel mining sustainable? To which extent does the nickel mining pollute the environment and the change a Caledonian landscape? What is the impact of nickel mining before and after the referendum on the independence?*

From the period of decolonization, we know that the process of transition to independence carries various difficulties and not always end successfully. Therefore, with the impending referendum appear important questions:

*What is the outcome of the referendum? May New Caledonia really become fully independent country in a future? What meaning is for New Caledonia remaining as a part of French overseas territories? What are the consequences of the referendum?*

In this work, the author will try to find the answers for all these research questions.

## 2.3 Methodology

Various research methods are used in the diploma thesis. Descriptive analysis of inroducs us to the nickel mining sector in New Caledonia in Literature review. The whole sector is well described including the presentation and historical and financial background of main nickel companies.

The synthesis puts into the context the history of nickel mining in New Caledonia with present situation on the world nickel market. It's necessary for understanding of the situation and for better projection of future possible development.

The indiction method is going to describe us the historical production cycles. There is a detailed description of enormous production down between 1971 to 1981, when the total nickel production fell down to a half. The cycles are continually repeating, so we can find a similarity with the present situation, when the prrices rapidly fall down too.

The deduction is going to verify author's hypothesis, which has been determined before starting of the research. The hypothesis is valuated by the results of author's research in conclusion.

Another very important method is comparison, in the thesis there are comparisons of nickel mining sector with the others, comparison of the nickel mining industry with other countries, comparison of economical and production results of three main Caledonian nickel companies.

In analytical part will author focus on historical method, based on the cognitive system of New Caledonia, which is important for understanding of the phenomenon in a broader historical context. It requires completion of logical methods in social phenomena.

The main part will include a comparison method for looking into results of two quantitative researches. Inhabitants of New Caledonia will be asked by questionnaire to answer the questions concerning the referendum of the independence. Both surveys will be separated for few years to see, how the opinions of the inhabitants are going to be changed.

Correlation analysis is going to find some relationship between the market prices of different metals, which have similar uses as nickel. If there is a significant positive correlation

between market prices of different metals, it is likely that there could be strong dependence. Second correlation analysis will show us dependencies between stocks of these metals.

Regression analysis is going to search the impact of the referendum on a world nickel price. Regression will show us, if the price was influenced by the result of the referendum or not at all. If yes, it is going to be measured, how big the impact is.

Author uses a quantitative method in his two surveys. Both surveys will be evaluated by a questionnaire. There is going to be a range of four years between surveys to find the changes of mind in a people thinking. Survey will help author to make an election poll through the Caledonian population for prediction of possible result of the referendum to confirm or disprove his hypothesis that: New Caledonia will remain a part of the French overseas territories and the majority of the population in a referendum will vote against independence.

### **3. Literature review**

#### **3.1 New Caledonia: Pearl of the Pacific**

New Caledonia is the Melanesian archipelago in the South Pacific, which is located in the Coral Sea, about 1,200 km east of Australia and 1,500 km northeast of New Zealand, a few degrees north of the Tropic of Capricorn. The exclusive economic zone extends over an area of more than 1,450,000 square kilometers and accounts for almost 13% of the French. New Caledonian maritime boundary adjacent to the Solomon Islands to the north of Vanuatu in the Northeast, with Fiji in the east, with Norfolk (self-governing territory of Australia) in South Australia and the West. (Auzias, 2015)

Caledonian lagoon with a total area of 24.000 km<sup>2</sup> is one of the largest lagoons in the world and is often described as a very beautiful lagoon in the world. It is surrounded by a coral reef 1600 km long, which is the second largest after Australian Barrier Reef. The water temperature is between 21 ° C and 30 ° C.

The area of New Caledonia is 18.575 km<sup>2</sup>, 15.743 km<sup>2</sup> are situated on the UNESCO World Heritage Site. New Caledonia consists of one main island Grande Terre, commonly called (Big Country), Loyauté Islands (Maré, Tiga, Lifou and Ouvéa), Belep archipelago on the north, the island of Ile de Pins in the south and from many small uninhabited islands. Grande Terre is divided on the length of the mountain range, which is called Chaîne centrale, whose highest peak is Mount Panié in the north (1629 m) and Mont Humboldt in the south (1618 meters). Capital of New Caledonia is Noumea. (Auzias, 2015)

The east coast is completely atypical areas with lots of natural attractions such as waterfalls, extensive high basalt cliffs as the basaltic rock in the shape of a chicken in the bay Hienghène. The west coast is unlike the East, characterized by rather arid areas and is rich in ores, mainly nickel. As the mountains are further from the coast, there are large areas of grassland and plains suitable for livestock, and these pastures are home to the Cowboys. Every year in August, the great celebration called Foire de Bourail is organized, where you can see among other examples cowboy arts or rodeo, which is the main point of the program. This is the most massive event in the country, which is visited each year by fifty thousands of people.



Climate of New Caledonia can be described as tropical. The tropical climate is strongly influenced by the ocean and winds, which reduce air humidity, which otherwise is almost 80%. Average temperatures are between 20 ° C and 23 ° C in winter, which is lasting from April to August. The average temperatures are between 27 ° C and 30 ° C in the summer, which is lasting from September to March. This is also the season of cyclones, the deadliest of them was the 2003 cyclone Erika, which has done enormous damages.

In New Caledonia, according to statistics for 2009, lived 245,580 inhabitants. From the years 1980-1990, population growth slows, but between 1996 and 2009 continues to grow at about 1.7% of the population per year. Populations grow strongly particularly in the southern province (2.3% per year on average between 1996 and 2009) and slightly in the Northern province (0.7%), while declining population on the islands Loyauté (1.3%). Half of the population is under 30 years old. Two residents of New Caledonia in three live in the Great Nouméa, three out of four were born in New Caledonia, and two of the five belong to the community of indigenous Kanak people. (ISEE, 2013)

## 3.2 History of New Caledonia

New Caledonia was first inhabited around 1000 BC. The first settlers probably come from Taiwan, in Caledonia are getting through the Philippines and New Guinea. Over time, they begin to differ from other Melanesian cultures. Kanaks, who today live in New Caledonia, are their descendants. Kanak word can be translated as a free man.

On 4<sup>th</sup> September 1774 navigator James Cook discovered a new land. Cook named this country New Caledonia in honor of Scotland, because his country's coast and its mountainous landscape reminiscent of Scotland, which stemmed from Cook's father. The ancient Latin phrase Caledonia is in fact the name of the province, indicating Scotland today. James Cook first stepped on the soil of the island of New Caledonia Nouvelle, which is now part of the capital Nouméa. Across the street from this place today is situated the University of New Caledonia.

New Caledonia was rediscovered by French explorers La Perouse and d'Entrecasteaux. New Caledonia, however, becomes a French colony from 24<sup>th</sup> September 1853. On 25<sup>th</sup> June 1854 a French military base was founded in the southwest Grande Terre, which was named Port de France. Port de France was built to serve as the administrative headquarters of the colony. This base is started to grow very rapidly, so on 2<sup>nd</sup> June 1866 a town named Nouméa was founded. (Outre-mer.gouv, 2011)

During the Second World War played an important role in New Caledonia, it became an important base of allies in the war against Japan. New Caledonia in 1942, the headquarters of the US Navy during the Battle of Guadalcanal. In Nouméa today is a memorial to honor the United States Navy. The real reason for the construction of the memorial was the fact that the war joined the original inhabitants of the Kanaks, with which Americans acted as equals.

After the war, France leaves the term colony and from New Caledonia thus becomes its overseas territories. New Caledonia after the war, has experienced rapid economic growth due to the mining of nickel, becoming the world's third largest distributor. Nickel mining and its economic importance devote a special chapter.

During the 80 years between Kanaky increasingly tendencies towards independence. Between opponents and supporters of independence increases tension.

Clashes reach a climax with a general uprising, when, during the years 1984 to 1988 are carried out actions against French rule.

On September 13, 1987 was the first and only referendum on independence for New Caledonia. Despite calls for a boycott of the referendum by Kanak Socialist Front for National Liberation FLNKS (Front de libération nationale Kanak et Socialiste), turnout was 98.3%. The vast majority, 58% decided that New Caledonia to remain a French overseas territory. (Vie-publique, 2009)

### **3.2.1 The carnage on the island of Ouvéa**

The outcome of the referendum provoked among the supporters of independence a large degree of resentment that has grown in the number of violent protests. Violence peaked on Friday, April 22, 1988 morning in Fayaoué on the island of Ouvéa Kanak separatists and members of the FLNKS stormed the police station, where at that time were 31 policemen. One of the officers refused to be held hostage, took a gun and started shooting. During the event they are killed four policemen and wounded three separatists. But Prime Minister Jacques Chirac announced through the media that they had been killed with a knife just three policemen. (Council of Europe, 1995)

This is contrary to the autopsy documents and the testimony of other officers. The remaining twenty-seven unarmed policemen were captured and divided into two groups. The first group went to the south of the island, the hostages were released three days later. The second group is sixteen hostage hiding in a cave at the base of Gossanah. France sent on Ouvea several hundred elite soldiers, who quickly discovered a group hiding in the south of the island, the second group, however, could still be found. Pressure from France to catch the remaining offenders were huge. Ouvéa Island is closed and declared a military zone entry ban reporters.

Cave, in which the separatists were hiding is finally discovered until April 27, after questioning people from the tribe Gossanah. After failed attempts at negotiation, the government on May 3 informs the president that the weather is favorable and all other conditions for a military operation are met. Warrant could be issued to Jacques Chirac, who proposed it, because he had no constitutional right to issue one. François Mitterrand, under

these circumstances, agree with a military intervention, and signed an order in accordance with its constitutional prerogatives.

Military action must take place early the next morning. Mitterrand wants the event was as still as possible with the least possible loss of life Kanak separatists, all under the utmost secrecy. A few hours later, however, the president canceled a military operation. Unfortunately, communication between the Champs palace and military garrisons on the site is established. The initial conditions for the possibility of the operation are no longer met. The whole archipelago learns about military intervention, the situation must be quickly and discreetly resolved.

Although they are to everyone's surprise release of the remaining hostages, the attack on the cave is running, the president shall not be informed. Sources for this topic show two contradictory versions. Military authorities have always denied release on executions. After surveying the command of Defense Minister Rocard said that the investigation revealed no shootings of unarmed hijackers.

A total of seventy-five soldiers were involved in the attack on the cave. During the attack, the nineteen hijackers and two soldiers were killed. FLNKS members and other supporters of independence later accuse the army of having an attack deliberately left to die or executed several hijackers. Many of the kidnappers was not armed or even surrendered, even though they were killed. (Le point, 2011)

Also important is the context of the events, at that time just peaked election campaign before the second round of presidential elections in France between the Socialist candidate and current President Mitterrand and the right-wing Prime Minister Jacques Chirac. The attack on the police station took place two days before the first round of presidential elections. The kidnappers wanted police to capture the second round of the presidential election.

François Mitterrand was elected President of the Republic for the second consecutive time. Mitterrand appoints the prime minister, Michel Rocard, who is responsible for dialogue and negotiation of consensus among proponents of preserving sovereignty of France and supporters of independence. This will lead to the signing of the Matignon agreements and granting a general amnesty for kidnappers and troops involved in suspicious deaths.

### **3.2.2 Matignon agreements (26<sup>th</sup> June 1988)**

French Prime Minister Michel Rocard, has agreed terms for a contract between opponents and supporters of the independence of New Caledonia. New Caledonia as a French archipelago in the South Pacific should take place within a decade steps leading to its self-determination. These steps are described in the texts published in the Hotel Matignon.

On June 26, 1988, Jacques Lafleur and Jean-Marie Tjibaou signed agreement, which outlines the contours of the new direction of the community. This historic agreement brought civil peace in the territory of New Caledonia, within ten years from the signing of this Agreement, namely in 1998, is scheduled referendum on self-determination and the future direction of the New Caledonia. (Terrier, 2010)

Condition of peace is an impartial stand for everyone. Condition of permanent peace is imminent neutral state in New Caledonia for a period of twelve months under the direct administration of the institutions of the French Republic. This helps create the conditions for a nationwide referendum on the political reorganization of New Caledonia.

Ensuring lasting peace, which is to ensure the opening of new perspectives for New Caledonia, is based on coexistence, dialogue and on the basis of social recognition of identity and dignity of every community living in the territory of New Caledonia, based on economic, social and cultural development of the whole area. The important role played education and ability to assume responsibility for all human community. It is therefore necessary to strengthen the powers of the state for a period of twelve months. The State should be the guarantor of strict impartiality and safety. Protection must be provided to all without distinction.

Institutional and structural arrangements were preparing the vote on self-determination. They also introduced institutional and structural measures which serve to prepare for the vote on self-determination. There is a division of the territory into three provinces, the Province of South, North and Loyauté Islands. This administrative division will improve the accessibility of public services and administrations in all areas. Division into provinces becomes a tool for balancing policy and development. In the Northern provinces and islands dominate Loyauté opinions supporting the country's independence, in the

southern province of contrary opinion prevails to remain within the French overseas territories. This is mainly due the fact that in the populous southern province of lives most French immigrants.

Each province is administered by freely elected by the Landtag, which is elected by proportional representation for six years. Routine matters are controlled by the territorial Congress, which consists of three provincial assemblies, representing the three Caledonian provinces. The number of members of each provincial assemblies must be in proportion to the population of each province.

The powers are divided between the representative of the French Republic and the local authorities. The State is in charge of external relations and foreign policy, immigration control and foreign police, external communication (navigation), supervision of maritime economic zone, currency, financial and foreign trade, defense, public security and police cooperation, nationality, marital status, justice, State civil service, civil law, criminal law, commercial law, principles of labor law, to review the legality of urban management, administrative and financial control of communities and their public institutions, secondary and higher education, audio-visual communication, sovereignty and ownership of property. (Matignon agreements, 1988)

The division of powers granted important rights to the provinces, within their competence must be an area of customary law, including economic, social and environmental. Other actors, including the division of powers as France, New Caledonia as a whole and the individual communes. France has pledged to spend significant funds to support the economic balance of the country, particularly with regard to public infrastructure.

Communes are the lowest administrative unit in New Caledonia, each commune has its own center, which has all the amenities: schools police, medical center, shops, markets etc. supporters of independence were denied access to critical responsibilities, may exercise the powers entrusted to the individual communes.

Matignon agreements, in addition to the above, incorporate and project the referendum law and take all necessary measures to enable the holding of a referendum. Government proposed to the president a bill that the president is obliged to submit to the French people. The voters of New Caledonia will be asked to vote on the law on the referendum, which is to

decide on the future direction of the country. The inhabitants of New Caledonia to 1998 have participate in polls, which are designed to determine the shape of future elections to provincial assemblies and provincial elections of selfdetermination. (Matignon agreements, 1988)

Referendum law to be an attempt to compensate with New Caledonia. France wants to prevent any abuse of its position to the detriment of New Caledonia and calm and escalation of the situation in its territory. There is also an extensive amnesty for crimes committed during the recent unrest, with the exception of violent crimes.

The tax burden of the regions is designed in such a way as to favor poorer areas, which are the Northern provinces and islands Loyauté. An important step is the sharing of power and responsibilities among the various ethnic groups. France creates a training program aimed at training police officers, especially among Kanak population and give it access to the highest positions. Everything will culminate on May 4, 1989, exactly a year after the massacre in the Cave tribe Gossanah. During the funeral act is assassinated by Jean-Marie Tjibaou separatist extremist Djubelly Weou that Tjibaou accused of treason Kanak nation. (Waddel, 2009)

Separatist camps are not unanimous, and some of them do not recognize Matignon agreements. Despite major concerns of France, to further extremist acts already there and implementation of agreements that no longer disputed by anyone.

### **3.2.3 Agreement from Nouméa**

The planned referendum on self-determination of New Caledonia was scheduled in 1998, a referendum could trigger tension between the inhabitants of New Caledonia. In order to avoid a referendum leads to new negotiations on the future of New Caledonia and its future direction. Separatists have put as a condition for access to upstream resources, which brought them a share of the proceeds large mining workshop, which will be built in the Northern province. France agrees to the terms.

The Agreement from Nouméa, also known as Agreement about NewCaledonia, was signed on 5 May 1998, the representative of France, Lionel Jospin, along with the main local political actors. The agreement also open a cultural center Tjibaou, which has become a

radiation Kanak supportive culture. Ratification of the agreement of a dork but must be approved by local referendum. To adopt resolutions voted 72% of voters. (Terrier, 2010)

Agreement from Nouméa finally remove the last vestiges of the colonial period and fully recognize Kanak national identity. Since 2010, New Caledonia does not belong to the category of the French overseas collectivity, but becomes a community sui generis of the French Republic, the only one of its kind. Nouméa Accord of further defining the deadline for holding the referendum on self-determination in between 2014 and 2018, if it approves it 3/5 of members of Congress. Caledonian citizenship gives, in 2018, its citizens the opportunity to take a common destiny into their own hands and become a fully independent state.

The Constitutional Act of March 1999 specifies, by 2018, a progressive and irreversible transfer of most powers to the political apparatus of New Caledonia. After this period, France will have sovereign powers only in the areas of defense, justice, police, foreign affairs and currency. In all other areas will have New Caledonia fully sovereign status. (Constitutional Act, 1999)

Do accession to full sovereignty of New Caledonia, Nouméa Agreement shall determine how such will be a gradual transfer of powers. During the four five-year electoral period, Congress agreed, any powers progressively transferred powers from France to New Caledonia. The agreement sets out a plan to get France involved in this process. France should also pay all the financial costs that this process will be incurred.

Some powers are transferred over five years to New Caledonia, while others remain for some time shared. New Caledonia and gains new powers in two stages. The agreement states that the first stage occurs during the first round of elections to Congress after signing from Nouméa (2000-2004) and transferred these powers:

- Foreign trade, including import controls and approving foreign investment;
- External communication for post and telecommunications except public roads and regulation of radio frequencies;
- Navigation and international transport services;
- External communications for air services, but must be in accordance with international commitments of France;



- exploration, exploitation, management and conservation of natural, biological and nonbiological sources of economic zones;
- The principles of labor law;
- main principles of vocational education;
- Criminal mediation customary law;
- Definition of penalties for infringements of the country;
- Rules for the provincial administration;
- The programs of primary education, teacher training and pedagogical supervision;
- The right for employment: New Caledonia, in cooperation with France, introduced special legal measures to ensure that specific guarantees and privileges to obtain jobs for the citizens of New Caledonia, which are measures to promote employment of Kanak original population. (Agreement from Nouméa, 1998)

Measures will be tightened residency and work permit persons who are not born in New Caledonia, or at least not French nationals. Self-employed persons with foreign citizenship, may also be restricted by law to conduct their business activities. Employers in the private sector will have to primarily employ local residents. The right to employment of foreigners and is fully the responsibility of New Caledonia.

Get a job and foreigners very difficult, I myself learned of it. Despite the many problems I had, thanks to his previous work experience to find an unpaid internship at a hotel where I worked at the banquet department. If Kanak with no experience would apply for my position, the hotel has to hire him on my place. Work permits can be obtained, especially in sectors, where the labor market is not a sufficient supply. It is mostly highly skilled positions.

Subject to the transfer of powers of the first stage are so particular areas: the right to employment, foreign trade, external communications, control labor law and vocational education, taking into account customary law in criminal proceedings or programs to support basic education and teacher training.

In the middle phase, ie in the second, third and fourth congressional election period (2005-2019), the following powers transferred to New Caledonia:

- Rules concerning marital status, under existing legislation;
- Rules of safety in air and maritime transport;
- Accounting and financial system of public administration and public institutions;

- Civil law and commercial law;
- Principles of control and supervision over land ownership and property rights principles;
- Legislation on juvenile delinquency and children in danger;
- rules for the management of individual communes;
- Administrative control of government and public institutions;
- Secondary education;
- rules for teachers in private schools under contract;
- Developing policies and implementation measures concerning public safety. (Agreement from Nouméa, 1998)

Yet France retains the option to take the necessary measures in case of lack of public security. Some powers fall within the shared, which means it would have to be involved in both France and New Caledonia. In the area of shared competences are for example. Regulate the rate of immigration, managing audiovisual communication, surveillance of international air services, higher education and scientific research.

### **3.2.4 Policy for Foreign Affairs**

International relations and foreign policy remain the full responsibility of the state. France takes into account the specific interests of New Caledonia in international negotiations led by France and takes them into account in the discussions. Yet envisaged future involvement of New Caledonia in foreign policy is first necessary. However, New Caledonia must be well prepared for the performance of duties in the field of international relations.

New Caledonia may already be a member of some international organizations (Pacific international organizations, the UN, UNESCO etc.), or at least cooperate with them in their position. New Caledonia may have representation in other countries of the Pacific region, and may enter into agreements with these countries in the areas of their responsibilities and cooperate with regional organizations and the European Union.

Over the centuries, New Caledonia has become a multicultural country with a population of different ethnic origins. Therefore, here we are facing a major contemporary problems such as integration of youth into society, the search for identity and steadily growing urbanization. These problems of modern times relate mainly to young people. As a

result of this arrangement, the company is required to ensure the best possible coexistence between Pacific nations and the preservation of Europe's cultural heritage.

Support of Kanak identity and its cultural heritage, political and social organization of New Caledonia should better reflect the identity of Kanak population. Special status of Kanak legal uncertainty fails to respond satisfactorily to certain situations of modern life. Special status, which has not yet been applied for Kanak population, is now called customary condition. The identity of every Kanak defined in relation to the earth from which it came. Emphasis is placed on customary law, strengthening the role of the customary areas and specifics Kanak culture. Recognized traditional authorities and their role in social prevention and lead to criminal liability. Transformation occurs customary advisory council to the customary Senate, which thus acquires legal legitimacy. Another important point is the support of Kanak cultural heritage. The extensive measures taken for its support include: the identification and recovery of local names, development of cultural objects and museums, education support local languages and cultural development in the arts and media training with the protection of copyright, technical and financial subsidies France of financial resources for the development of Tjibaou Cultural Centre, which is perceived as a center of Kanak culture. (Néaoutyine, 2006)

The final point I would like to mention about the development of Kanak culture are symbols of New Caledonia, which represent the country's sovereignty. The symbols form the country's name, flag, anthem, motto and its own cartoon bills, which together represent historical Kanak identity and a common future. New Caledonia is the only country that has two national flags that have absolutely equal status.

Agreement from Nouméa have managed in creating consensus solutions. New Caledonia is a community completely original in French law. Already today we can say that this is a country of shared sovereignty. This process should continue until France will remain a necessary sovereign powers. From next year, 2014, New Caledonia can move even further and become a fully independent country.

### **3.3 Economy of New Caledonia**

New Caledonia is one of the most economically advanced countries in Oceania. Currency of New Caledonia is a Pacific Franc XPF, which is fixed to euro in exchange rate 1 EUR= 119.332 XPF. According to 2013 data, the total gross domestic product of New Caledonia was 886 billion XPF (=7.42 billion euros). It represents value 3.4 million XPF per person (=28,492 euros). It's an increase by 1.4% in comparison with previous year 2012. New Caledonia is entirely dependent on the extraction of nickel. This one-sided orientation is fraught with pitfalls. The main problem is instability in the market price of nickel, the amount of which so affects the economic situation of the country. On the other hand, nickel is the future longterm secure income. (ISEE, 2014)

The important factor is the favorable climate that gives New Caledonia possibility of year-round agricultural production. There are also other important sectors which are economically important to New Caledonia, although economic prosperity of country is mainly due to the extraction of nickel. The question is whether New Caledonia is able to fully exploit the potential of these sectors.

#### **3.3.1 Agriculture**

Although the amount of agricultural production increases, grows with it and the amount of imported agricultural products from abroad. While in 2006 the ratio of own production and imports almost identical, in 2011 already 60% of agricultural products imported. It is expected that this trend in coming years will continue.

Very important sector of agriculture remains the production of fruit and vegetables. This production is about 37% percent of all agricultural production in general, which is the most masterfully, because catching fish breeding cattle consistently holding to 16%. Of fruit and vegetables grown are intended only for domestic consumption, and is not. Although the amount grown vegetables (12,200 tons in 2014) is about three times higher than the amount of fruit grown (4,500 tons in 2014), vegetables are still being imported into the country two times less than it had grown. For fruit, this ratio is very unstable, imports exceeded domestic production in 2014. (Author's translation)

Among the crops grown in New Caledonia include coconuts, papaya, sweet potato, banana, vanilla or citrus fruits.

In terms of livestock is crucial for New Caledonia beef production, which allows the country to be self-sufficient in this area. Cattle are bred exclusively on the vast grassy plains, farms on the west coast.

The annual beef production reached the maximum of 4,018 tons in 2004, in 2014 it was 3,482 tons. The beef production is stable, there are not big increases or decreases of the production. The Scot, however, is bred primarily for local consumption market is highly regulated and institutions are dependent on government regulations New Caledonia. Conversely, milk production is to meet the needs of New Caledonia insufficient. In 2005, it processed only 804,000 liters, it is therefore necessary milk and other dairy products import. Most milk is imported from Australia, where in 2005 imported more than 65 million liters. Nowadays the milk production is less than a half, it was only 361,000 liters of milk in 2014. (ISEE, 2015)

Major agricultural sector is also fishing. "Exports of fish from New Caledonia reached a record rate in 2001, when it exported 1,276 tons of fish, which are three-fifths (61.8%) of the total number of 2,064 tons of fish caught in New Caledonia. In 2009 it was also exported nearly 1,000 tons of fish (947 tons and 37.2% of total production of 2,548 tons), which is the most since 2003. In 2014 was caught 2781 tons of fish, it represents third best result in Caledonian history. (ISEE, 2015)

### **3.3.2 Mining and manufacturing**

Although New Caledonia especially important for the extraction of nickel were found here and other minerals, such as gold, copper, chromium, iron, carbon or manganese. However, it is important to note that none of these raw materials are already in New Caledonia continue to be mined. Either they were already all their stocks completely mined or not their more profitable mining.

Gold deposits were discovered in the extreme north of Grande Terre in 1863. The most significant deposit was discovered eight years later, the mine Fern Hill has over seven years harvested 213 kg of gold. In the north of the island is also mined copper, which are benefited

more than nine thousand tons. In the early 20th century was discovered in the north and the south of Grande Terre deposits of chromium, chromium was first mined only surface, but since the 90s is mined in mines. In New Caledonia, was excavated more than 2.7 million tons of ore rich in chromium. (Brou, 1970)

For New Caledonia is still significant and mining, cobalt mine began here in the late 19th century and until 1905 its production covered almost the entire world production. Nowadays cobalt mined solely as a by-product from the extraction of nickel, but which has four times higher price.

### **3.3.3 Tourism**

New Caledonia is certainly an attractive tourist spot, unable to fully exploit its potential and attract more tourists yet. Tourism is therefore constantly evolving. The biggest tourist attractions are the pure white sandy beaches, subtropical to tropical climate and especially the transparent lagoon with coral reef after Australia's Barrier Reef second the largest in the world. Tourism in New Caledonia began to develop in the early 80s.

The Tourism is after mining nickel second most important economic sector. He reached its peak tourism in 1984, when New Caledonia was visited by more than 91,000 tourists. During the political events and clashes between supporters and opponents of independence between 1984 and 1988, there was a significant setback for further development of tourism. In 2004, the number of visitors to New Caledonia reached its lowest level since 1996, but their number is about boundaries hundred thousand visitors. The year 2015 reached the new record, when 113,951 tourists visited New Caledonia

The tourism industry employs more than 4,500 people, which is about 6% of the total workforce. Tourism thus constitutes 4% of GDP. A strong rebound in tourism, there in 2011, when historically the most tourists visited New Caledonia and set as absolute record of over 111,000 visitors. In 2011, New Caledonia was visited by many people from metropolitan France (31%), followed by Japan (16.5%), Australia (15.25%) and New Zealand (5.75%). (ISEE, 2016)

This sharp increase was due to the holding of XIV. Pacific Games, organized by the International Olympic Committee, which was attended by athletes from 22 countries of the Pacific region.

### **3.4 Institutions of New Caledonia**

#### **3.4.1 The High Commissioner (le-Haut Commissaire de la République)**

The High Commissioner is appointed by presidential decree on the proposal of the Council of Ministers. The High Commissioner ensures the proper exercise of powers by the authorities of New Caledonia and the provinces in accordance with the law. The High Commissioner may, in all cases, take all necessary measures to ensure civil security, if measures haven't been already taken by the other authorities of New Caledonia. (Constitutional Act, 1999)

Agreement between the State and New Caledonia or of a province, signed by the High Commissioner and the Prime Minister or the President of the Landtag set rules and conditions of the mutual funds, services and assets for New Caledonia powers and its provincial and state. The High Commissioner may, after informing the president, to ask for the inclusion of a proposal on the agenda of the Standing Committee of Congress. This proposal will be discussed after the request at the first meeting of the Standing Committee.

At the request of Congress or a Provincial Assembly can independent administrative authorities and national public institutions to exercise certain powers that are delegated to them authorities of New Caledonia and the provinces. The conditions of this delegation are set by agreements between France and its institutions on the one hand and New Caledonia and its provinces on the other. Information on these agreements is required to pass the High Commissioner. (Decree no. 2007-423, 2007)

The function of the High Commissioner was before signing an agreement from Nouméa important functions of the supreme representative of the State in the territory of New Caledonia. The High Commissioner perform a number of functions, thanks to its powers which have been conferred. Although the High Commissioner formally still the highest representative of New Caledonia, today has been the only function of a broker of interests

between the State and New Caledonia. Primarily oversees the observance of civil security, justice and fair exercise of the powers of state and local authorities.

### **3.4.2 Congress (le Congrès)**

Congress is consultative assembly of New Caledonia. The Congress has 54 members, seven members are elected by the Assembly of Loyauté islands province, 15 members of the Assembly of the Northern Province and 32 from the southern provinces. Members of Congress are elected for five years. (Le Congrès, 2016)

When dissolved Assembly one of the provinces, members of the Provincial Assembly, who are also members of Congress continue to remain members of Congress until the election of a new Assembly of province. The Congress elected annually from among its members a bureau consisting of a President, Vice-Presidents, Secretary and

Congress elects the President, who is also the essence of its chairman. The president is elected secretly by an absolute majority of 3/5 votes of all members of Congress. Unless the president the first two rounds, held the third round. In the third round, the candidate who receives the most votes. In the case of re-tie, the oldest candidate elected. Congress president position is inconsistent with the position of President of the Assembly of the province. (Garde, 2001)

Congress has a number of important powers, it is one of the most important budgetary powers. Congress must approve an annual budget of New Caledonia with regard to the tax burden on citizens. Congress may issue a regulation to modify the legal matters falling within its competence. In criminal cases, Congress may impose penalties for actions that meet the classification of offenses rather than crimes. Criminal sanctions imposed by Congress must not exceed the penalties in the legislation of the French Republic for similar offenses. All the fines and other financial penalties go into the budget of New Caledonia.

Congress may adopt resolutions on matters falling within the jurisdiction of the State where it was created, amended or repealed law or regulation relating to New Caledonia. Opinion Congress is addressed by the president of Congress, the Prime Minister and the High Commissioner. Resolutions adopted by Congress are further discussed by the French legislation, which after consultation, decide whether the statute for New Caledonia will pay



or not, or possibly an exception will be made taking into account the specificities of New Caledonia.

The Standing Committee of Congress (la Commission permanente) is elected annually from among members of the Congress. Standing Committee is composed of seven to eleven councilors. The Standing Committee acts under delegated powers granted to it by the Congress. The provisions adopted by the Standing Committee shall not involve the proposed legislation of the country or proposals concerning the budget of New Caledonia and other regulation of a fiscal nature. The Standing Committee shall primarily address issues whose discussion requested by the government.

### **3.4.3 The gouvernement of New Caledonia (le Gouvernement de la Nouvelle-Calédonie)**

The executive body of New Caledonia is a government that is elected by the Congress and is responsible to him. The chairman and other members of the government remain in office until the expiry of the mandate of Congress that the government chose. The number of cabinet members is between five and eleven members, will determine the exact number of each newly elected Congress, during one of the first meetings. The new government is to be elected no later than twenty-one days from the first session of Congress. When choosing a new government must be present at least 3/5 of all members of Congress. (Gouv.nc, 2016)

The government of New Caledonia is seen as a public authority, therefore, the position of Chairman and other members of the Government are incompatible with membership in the customary Senate, Economic and Social Council or the provincial Assembly. The government is elected by an absolute majority in a secret ballot. The Prime Minister is elected from among the major groups represented in Congress, First VicePresident is elected on the contrary, the opposition movement. Since 1999, the Prime Minister is elected from among supporters remain within the French Republic and the First Vice-President from among the supporters of independence.

The government is based on the collegial principle, it is the principle of constructive opposition when the opposition minority political groups trying to submit draft laws and to jointly find a political consensus. The main political forces represented in the government and in Congress must always find a common solution, which is a prerequisite for the

successful management of New Caledonia. The government as a whole is responsible for the management of the country within its powers. Government adopts its decisions by vote, to approve the proposal must always be a majority of members of the government. In the event of a tie, the chairman shall vote. Each member government is responsible for one or more sectors, but unlike members of the government of French Polynesia, New Caledonia member of government has the statute Minister.

Government prepares and executes the resolutions of the Congress and its Standing Committee. Through authorized by Congress gives the regulatory laws that are necessary for the proper functioning of the country. The government is accountable to Congress, the Prime Minister after his election, delivers a speech before the assembly, which presents its policy, also submit a report annually to Congress on the fulfillment of pre-arranged objectives.

If Congress is not satisfied with the government policy, may file a motion for a vote of no confidence in the government. The petition must be signed by at least one fifth of the members of Congress to censure the government is then required absolute majority of all members of Congress, at least 28 votes. By order of the government itself may agree to the resignation of one of its members. Demise must include a proposal to appoint a new candidate, whose election must be approved by Congress. When one of members of the government resigns, the government does not need to resign as a whole. The High Commissioner has to be informed about the change in government. The government can delegate certain powers on its President to accelerate the legislative proces.

The government is taking measures on foreign labor, oversees the access of local people to public employment opportunities and availability of public institutions, compiles import plan, approve the rates and charges for postage and telecommunications, determines the amount of remuneration of officials of New Caledonia and other state employees, appoints public and ministerial officials and awarded honorable mentions, sets fixed prices and regulated tariffs (regulated price of fuel), determines the nature and extent of provision of public services, enters into agreements with traders and farmers, regulates and organizes the service, the conditions for the operation and implementation of publicly community work, decides to accept or reject donations and legacies in favor of New Caledonia, manages assets of New Caledonia, concludes credit agreements and adopt safeguards under the conditions set by Congress, prepares the codification of the laws of the country and the regulations issued

by New Caledonia, determines an easement in favor of New Caledonia , decide on projects, draft laws of the country or the decisions of Congress and the state parliament, relating to mining and quarrying in mines and establishes investment fund New Caledonia and manages the issuance of government securities or securities guaranteed by the government and authorizes the issuance of bonds of New Caledonia. (Bertram, 2008)

#### **3.4.4 Customary Senate (le Sénat coutumier)**

Customary Senate is an assembly composed of individual councils of customary land. Customary Senate is composed of six members appointed by the respective Board habitual traditions and accepted practices. Each of the three provinces has two members in the customary Senate, who also representing various customary areas. Customary Senate has mainly advisory role, it is dealing with priority issues relating to the consideration of interests of the indigenous Kanak population.

Any law or other legislation affecting the identity Kanak as must first be discussed by the customary Senate that it will issue its opinion. Customary Senate also has the opportunity to attend a government meeting or congress, if discussing a bill affecting Kanak identity. Moreover, it has an advisory function when approving projects or legislative proposals relating to the identity of the country, customary civil status and especially land. The soil is for Kanak residents very important part of their traditional culture, so they can express their opinion on all regulations that would in any way restrict the use of traditional areas of indigenous tribal settlements. Of the eight customary areas is five of them located on Grande Terre and the other three islands lying Loyauté. Each of the eight customary areas has its own habitual advice. Composition of the customary council is fully the responsibility of the individual areas that council members elected by local custom.

Customary Senate is debating proposed legislation in the country within two months of their assignment. If the customary senate in this period expresses his opinion, the bill is taken as the Senate approved. Adjustments recommended customary Senate are then subject to a vote of Congress. If Congress does not accept the adopted amendments to the law customary Senate, submit to the Congress of the Chamber's own final bill. If the customary Senate within one month bill again fails to take final decision on approval of the act remains to Congress.

The new chairman is appointed every August or September to one year, depending on the principle of the rotating presidency of the eight customary areas. At the request of at least six customary councils may be dissolved customary Senate. This request may not be submitted in the six months prior to the due date of the election of new members of the customary Senate. Newly elected Senate is customary in office only until the end of the term of dissolved customary Senate. (Senat coutoumier, 2016)

Customary Council consults any matters with customary Senate that fall within their fields of competence. If it is necessary, the Council may consult on important issues with the High Commissioner, the Government, the Chairman of the Assembly or the mayor of the commune. This mainly concerns issues regarding the interpretation of customary rules and their incorporation into the legal system of New Caledonia. In case of disputes or ambiguities customary rules governing authorities of turning on customary council, which has a deadline of three months to express their opinions.

#### **3.4.5 Economic and Social Council (le Conseil économique et social)**

Economic and Social Council, another consultative body of New Caledonia, which deals with the laws, regulations and other regulations that interfere economic and social fields. Discusses proposals to Congress or the government and formulate advisory opinion submitted by the Prime Minister or President of the Congress. The Council may, of course, their decision to consult with other political bodies, such as the customary senate and provincial Diets. Economic and Social Council has one month in which to express its opinion on the draft or project, if necessary, this period may be shortened to only fifteen days.

Economic and Social Council is composed of thirty-nine members, of which twentyeight members representing professional organizations, trade unions and associations that contribute to the economic, social and cultural life of New Caledonia. Members are appointed by the provincial Assembly: four for Loyauté islands, eight for Northern province and sixteen for the Southern province. The other two members are appointed by the customary senate and the last of nine members designated by the Government, after consultation with the chairman of the provincial assemblies, is composed from qualified individuals in the field of economy, social and cultural fields of New Caledonia. The members of the Economic and Social Council are voted for five years. (Senat, 2012)

Economic and Social Council conducted a study on its own initiative concerning matters related to the development of New Caledonia. The Council seeks to work with young people who need to gain the necessary experience. Every year the Council receives a number of interns and creates more jobs, which occupies mainly from local Caledonian young people. Economic and Social Council and helps them to fully integrate into the workforce, enabling work experience that will help them in their further professional growth.

Part of the work of the Economic and Social Council is also developing cooperation with various socio-economic actors on Grande Terre and the islands. This cooperation is important mainly due to the understanding of reality. The Council is to serve as an intermediary between of power authorities and socio-economic actors and to avoid possible conflicts of interest, the function is a member of the Economic and Social Council is incompatible with the mandate of deputy, senator, representative in the European Parliament, member of the provincial Landtag member of the government or the mayor of the commune functions of a member economic and social Council is incompatible with the mandate of deputy, senator, representative in the European Parliament, member of the provincial Landtag member of the government or the mayor of the commune. The Council should always find an effective consensus solution that would prevent the adoption of dysfunctional legislation. In relations with the external socio-economic world is an economic and social council member of the Assembly of regional economic and social councils of France.

#### **3.4.6 Provinces and communes**

The provinces are administrative units that have competence in all matters that are not subject to the law of the state, New Caledonia and the individual communes. Each province has its own provincial province's assembly, whose members are elected by direct universal suffrage for a term of five years. Each province consists of several communes, which are the lowest administrative units on the territory of New Caledonia, which could be likened to the Czech districts. Communes are generally 33 and their activities subject to inspection by the provinces. They are the last stage of the process of decentralization of New Caledonia. All the powers of the provinces are in the hands of the state Assembly, with the exception of those that are intended for the President of the Assembly.

Assembly elects a chairman from its members, who were elected to Congress. This choice is made by secret vote, a candidate wins with an absolute majority of 3/5 votes. If the Chairman is not elected in the first two rounds, the two most successful candidates are advanced to the third round, where the candidate with a majority of votes wins. If it is equal again, older candidate wins. New chairman choices remaining members of Bureau after the election. (Corneille, 2006)

### 3.5 Ferronickel & nickel matte production

Nickel is a metal with a specific composition, which allows further processing to ferronickel. More than two thirds of nickel are reduced to crude ferronickel. Ferronickel is obtained by refining the primary metal to bring its membership around 27% of nickel through series of operations that dispose of the its sulfur. The crude nickel is polished by the same procedure as steel. At first it is kept under reducing circumstances to get rid of sulphur. Afterwards it is polished under oxidizing conditions with appropriate fluidities eliminate carbon, silicon and phosphorus. From ferronickel we can produce stainless steel.

We can also transform ferronickel into nickel matte. The nickel matte is produced by the addition of sulfur and elimination of the air blowing by iron in Bessemer converters, called the name of the inventor of the process. The raw material consists of ferronickel out of Demag furnaces, ingots and remelted in order to eliminate some of their iron. In the end, the matte contains 77% of nickel and iron. (SLN, 2016)

For this transformation we are using SLN matte converting process, when we mix the ferronickel with elemental sulphur and afterwards it is transformed into a matte in a Peirce-Smith converter. The next step after the addition of the sulphur the matte is wafted with the fresh air in demand for oxidization of the iron. The iron needs the air for the next processing, when we put it into the flash heater or shaft furnace to transmute the oxidized ore to nickel matte. Afterwards we merge the ore with coke, limestone and pyrite and put it into the sinter engine. The sintered matte is smelted in the heater using the air with a high percentage of oxygen to produce furnace matte. We use one more time Pierce-Smith converter to blown it up into a superior converter matte. If we use the Inco selective reduction smelting process the ores after the process of oxidization are directly transformed into nickel matte. The ore is wet so we need to dry primarily, then it's partially deflated in a rotating furnace by addition of coal and sulphur oil. Now we add an elemental sulphur into an electric furnace to gain the matte, which we can upgrade even more in another air-blown converter. (Reuter et al, 2005)

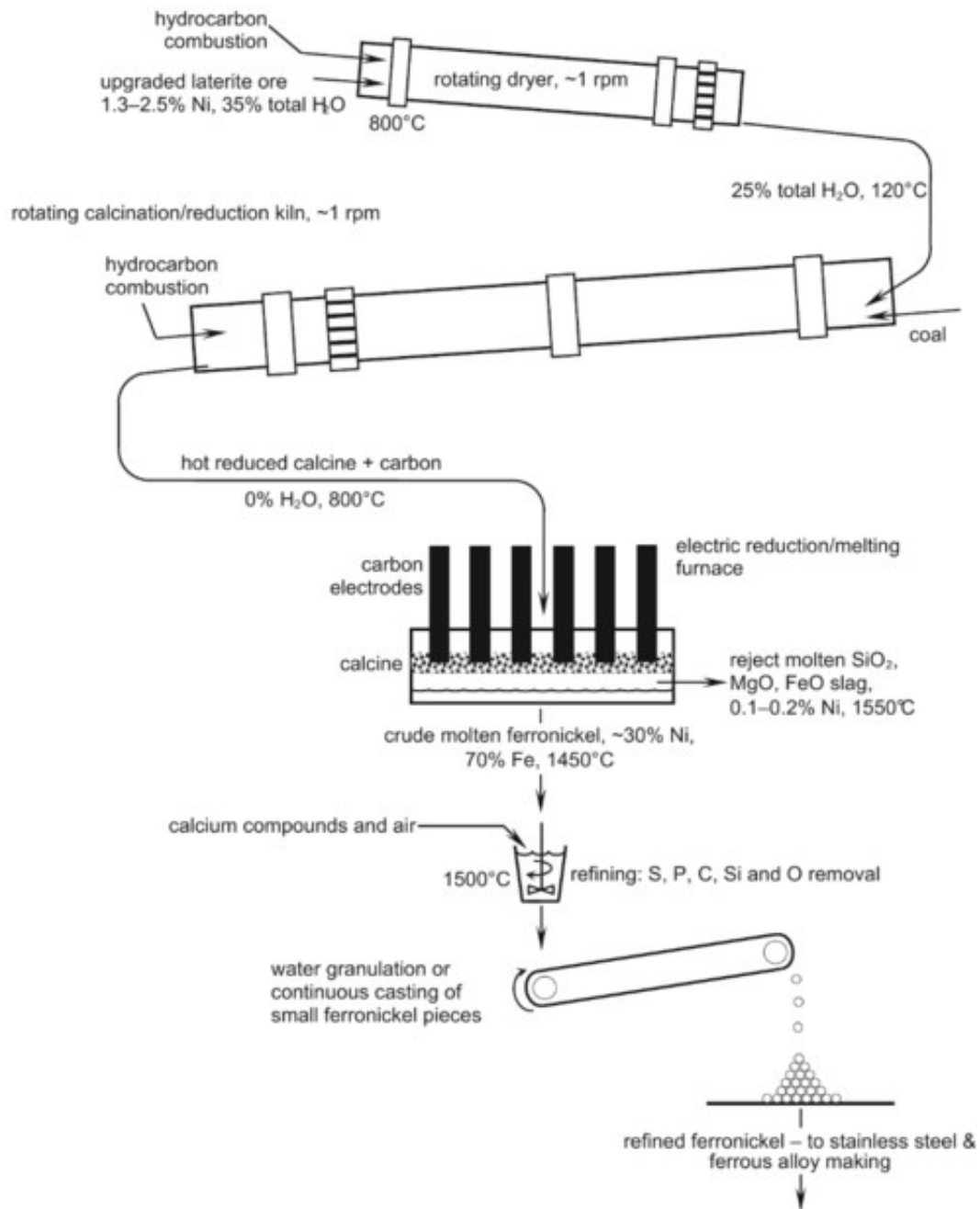
The final step of withdrawal of a pure nickel can be made by two hydrometallurgical processes: The first process is called Caron process, partially reduced ore is infused by using of ammoniac. The second process is called Moa Bay process, when the ore is pervaded by application of a direct sulphur acid density leach. Then we can finally gain a secondary

processed nickel, which is known as stainless steel. This usually many times melted and polished intermediate is ready for a production of a new stainless steel. The nickel is very often recycled from old stainless steel scrap. The recycling process is considering around 80 percent of the nickel products, which finished its proper functioning. Other nickel materials like electronics, remains or other nickel products, which are not ready for the further processing are recycled to primary production through production processes of other metals. The usage and recirculation of nickel from industrial, construction and machinery tenders, large transportation tenders for an aerospace and marine and the other claims, is expected to be improved through other methods. (Reuter et al., 2005)

For simplifying the smelting process of laterite ores to yield ferronickel is based on two main principles. The first principle of ferronickel smelting is that the reduction of nickel and iron oxides is easily reducing oxides to metallic nickel and iron, while the reduction of the other oxides is not implemented. The second principle of ferronickel smelting is that laterite ores cannot be smelted to pure nickel metal, which doesn't include any iron. This means that the product of laterite smelting is always ferronickel, which contains between 20% and 40% of nickel and between 60% and 80% of iron. We cannot delimit both parts from each other. There is no problem that the iron is included in the ferronickel, because it is a crucial component in stainless steel and other ferrous alloys. The expenditures of production increase with higher content of iron, because proportionately more energy is used for reduction, heating and melting. The production of iron is even more complicated and of course more expensive than nickel processing. For this reason, ore selection, amalgamation and advancement are extremely important. (Crundwell et al., 2011)



**Figure 1: Schematic diagram of the flowsheet for smelting moist**



**FIGURE** Schematic diagram of the flowsheet for smelting moist 1.5%–2.5% Ni, low-iron laterite (saprolite) to ferronickel.

Source: (Crundwell et al., 2011)

### 3.6 History of nickel mining in New Caledonia

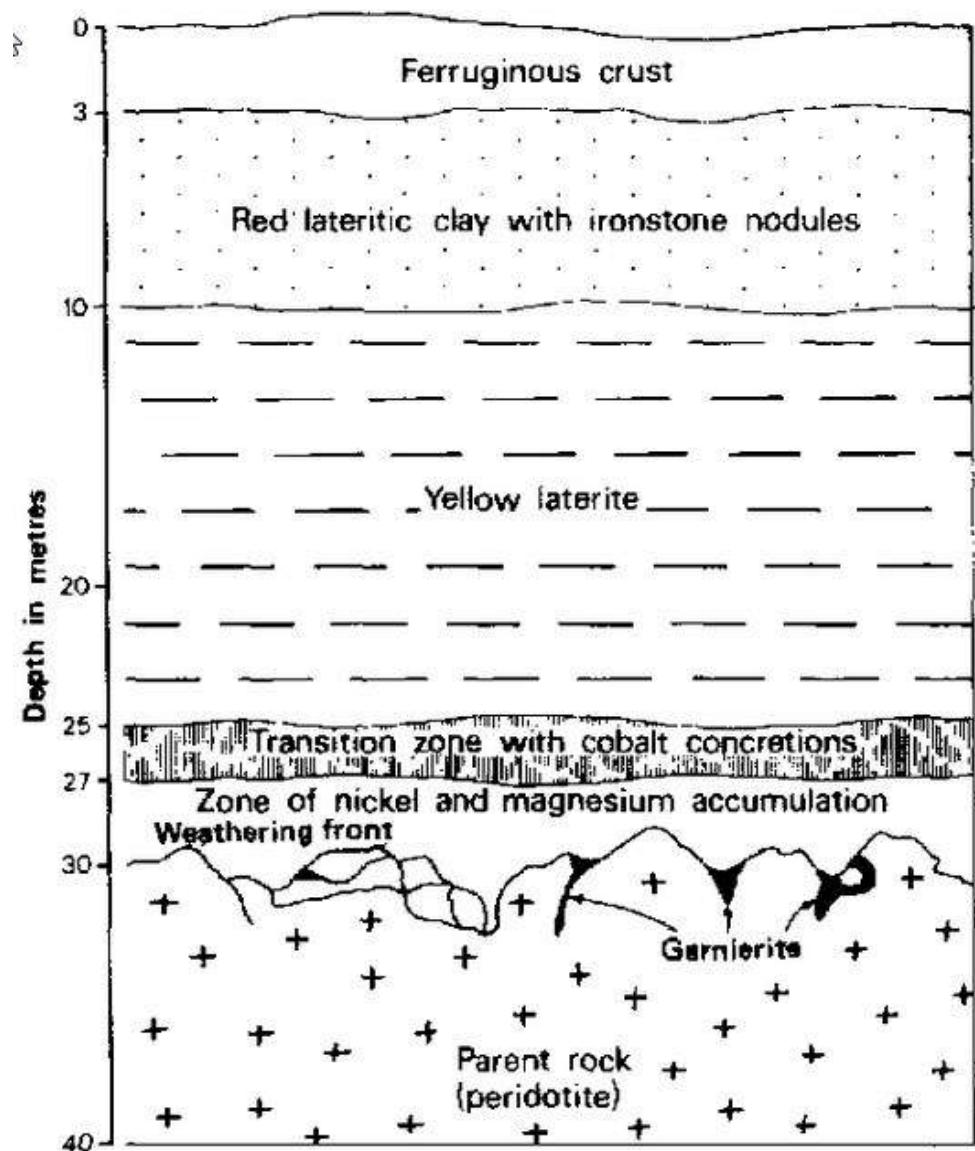
The history of nickel mining is beginning in 19<sup>th</sup> century. I'm going to use classification (Doumenge et al., 1986) of three big periods of massive intensive growth of nickel mining in New Caledonia. Three great periods of increasing intensity, mark the history of nickel:

- 1) 1864 – 1904 3% of total world production
- 2) 1904 – 1967 41% (10,000 tons in 1940)
- 3) 1968 – 1977 56% (151,000 tons in 1971).

The nickel ore in New Caledonia was discovered in 1864 by the Jules Garnier. The ore garnierite, which is named after Garnier, contents only about 0.2% of nickel. Nickel is present in peridotites, which cover more than one third of Caledonian biggest island Grande Terre. Nickel is liberated from ore by hydrolysis of nickel bearing silicates. Afterwards it's concentrated to a base weathering profile, where we can reach a nickel concentration from two to five percent. At the front side of enduring profile head to head to the bedrock and in rock crevices, the concentration of nickel can be from ten to fifteen percent in a form of green garnierite. This very rich green garnierite is found only in very limited amounts. Nowadays we can use modern technological machines, which can reach the nickel from ore with a nickel concentration only about 2.6%. We can find about two hundred million tons of this nickel ore. We have also a huge amount of laterites, which are situated only few meters under surface and have a concentration only from 1.3 to 1.6 percent. I can see in it a huge future hidden advantage for the future development of New Caledonia's economy. The technical progress is running fast in this field of industry, so we can expect that in near future the machines are going to be able to reach nickel from these laterites too. (United Nations University, 2010)

Weathering Profile Characteristic of Hilltop Plateaux on Ultrabasic Massifs in New Caledonia. shows the typical locations of nickel ore (garnierite) at the weathering front, and zones of nickel, chromite, and cobalt accumulation beneath the red and yellow laterite horizons and the ferruginous crust.

**Figure 2: Weathering Profile Characteristic of Hilltop Plateaux on Ultrabasic Massifs in New Caledonia**



Source: United Nations University, 2010

The economy of island is depending on nickel mining, the lack of the demand in 1970's could ruined a whole Caledonian economy. Fortunately world demand for nickel increased in 1980's. It increased again the Caledonian foreign trade, which is a must for Caledonian wellbeing. During the crisis New Caledonia had to find new market opportunities to save its economy like mechanic engineering, building constructing or general merchandising.

The economy was and till nowadays still is dependent on imports. New Caledonia wanted to be at least independent in energetic production. The electric power was produced only by small local plants, especially by a big dam on Yaté river and by a big factory Doniambo. It covered all domestic consumption, but there wasn't enough energy for exportation.

The tradition of nickel mining in New Caledonia begun in 19th century, more precisely in 1875, when nickel production has started. Not all nickel ore has been smelted in New Caledonia, around 50% of total production have been exported to foreign countries, mainly to Japan. From 1875 to 1981 there were more 110 million tons of nickel ore, what correspond to 2.5 million of pure nickel. (United Nations University, 2010)

At the beginnings of nickel mining in New Caledonia people were mining nickel by hands in tunnels or in ditches to get nickel from the richest layers. The mining has modified into opencast with a higher level of development of mechanization. Nowadays workers are using mechanical shovels, which can go deep from five to eight meters into a rock. Afterwards the sorted ore is taken by huge trucks to the harbor or in the main plants, there are belt conveyors, which take the mined ore directly to the processing factory. The nickel ore has to be sorted a lot, there are around five tons of rock material, which have to be removed to gain one ton of nickel ore. This has a huge impact on changes in the landscape, because enormous amounts of the soil and rocks have been displaced. The nickel mining is accompanied by the interference to the countryside of the island.

The huge decline in 1970's was accompanied by world economic crisis, which negatively influenced the nickel price and also the demand for nickel. The new concurrent countries as Philippines or Indonesia entered the world nickel market. How I have already

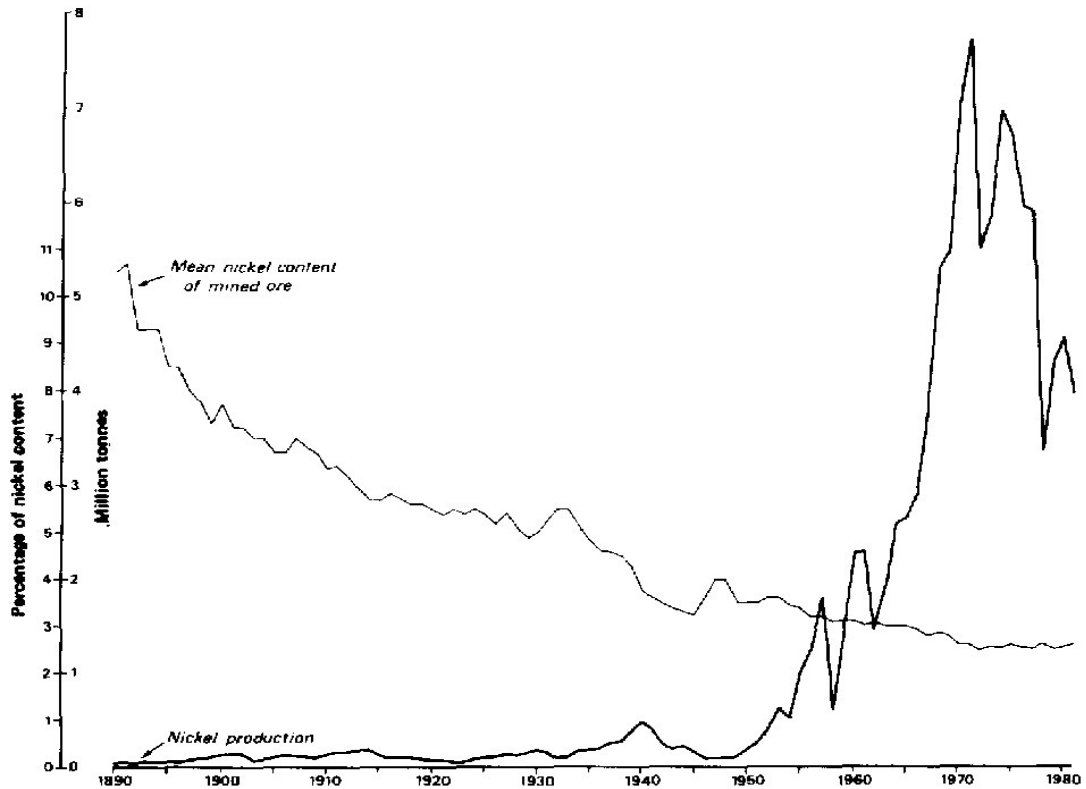
mentioned, the production declined a lot. The production was situated on more than 380,000 hectares, which represented almost one quarter of the surface of the largest Caledonian island Grande-Terre. More than 50% of this surface was handled by the Caledonian biggest nickel company SLN. The rest was divided between other seven companies.

Four main plants have produced till nowadays more than 62% of nickel ore. Thio mine, which is used since 19<sup>th</sup> century has produced more than 24% of total production (Plateau de Thio – 17% and Thio Mission – 7%). Another ancient mine is situated in Kouaoua, which has produced 14% of total production. On the third place are two mines Poro and Népoui, which have already produced around 12%. These two mines were founded during the main Caledonian nickel boom from 1968 to 1973. (United Nations University, 2010)

The rest of the production is coming from small mines. I will mention only Massif de Koniambo, which was closed from 1950. Massif de Koniambo produced more nickel ore than Thio mine some years. The reason of closure of Massif de Koniambo was protection of Caledonian nickel reserves. Today the Massif de Koniambo is still a plant with the most nickel reserves of garnierite in New Caledonia, even though the production has been reestablished.

The impacts of nickel mining activities on Caledonian landscape were really huge. The volume of mined waste material influences the countryside many years after the closure of the majority of mines. Even though mines are already closed many years, there are visible the modifications caused by mining as well as on places, where the nickel is still mined.

**Figure 3: Development of Nickel Production in New Caledonia 1890 to 1981 and Mean Nickel Content of Mined Ore during That Period**



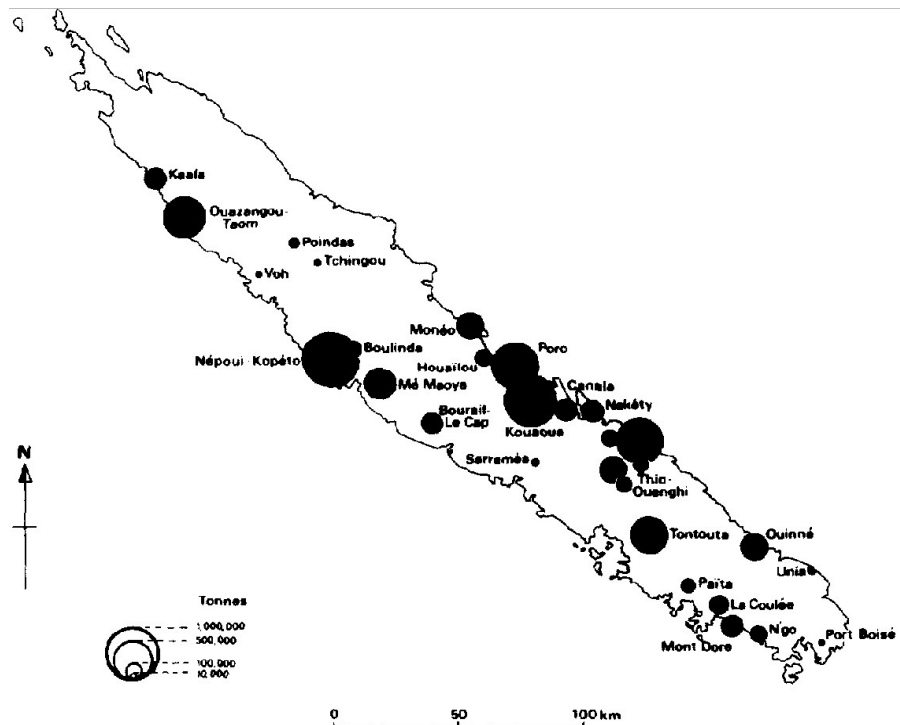
Source: United Nations University, 2010

In the graph above we can see development of nickel mining in New Caledonia from 1890 to 1981. There is no dramatic change of nickel ore production during this period. From 1890 to 1950 the production stayed invariable, there was only slight increase during Second World War in 1940, when it reached for the first time the quantity 1 million tons per year. From 1950 the production started to grow intensively with high fluctuation. The massive increase started at the end of 60's and finished in 1971, when the production reached almost 8 million tons. The production grew a lot every year besides years 1958 and 1962. From 1971 the production started to decline. The production decreased from 8 million tons in 1971 to 4 million tons in 1981.

We can also see in the graphic, how the percentage of nickel content of mined ore declined during this period. In 1890 there were 10.5 % of nickel in mined ore, but in 1981 it was only around 3%.

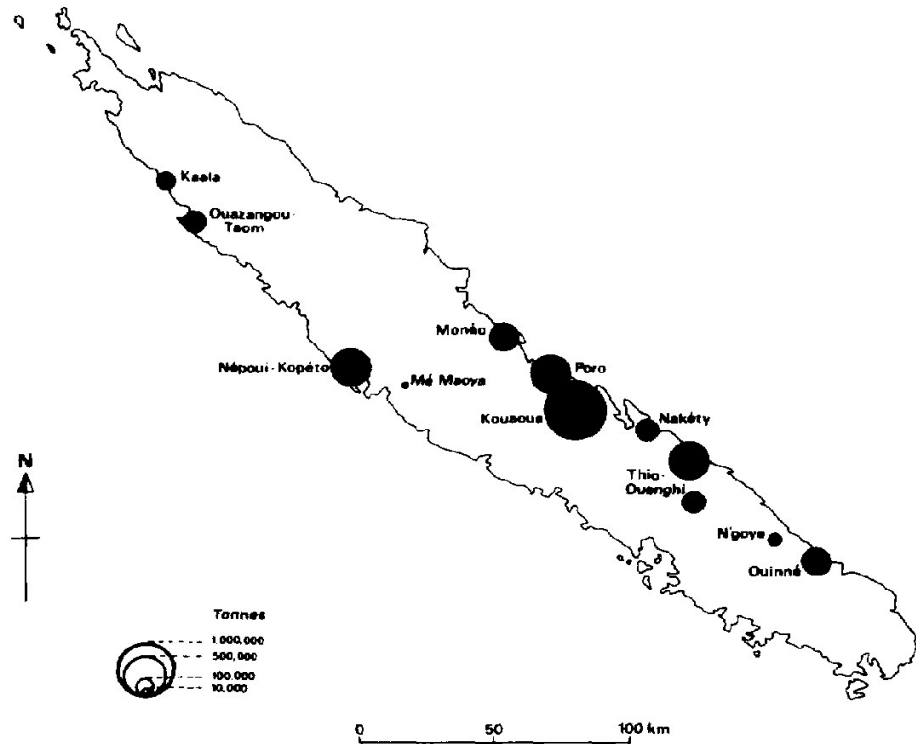
We have two figures, which are showing us the production of nickel ore in 1971 and 1981. How we can see, there is a decrease of 50% from 7,720,000 tons in 1971 to only 3,980,000 tons in 1981. Nickel ore was mined from many small size mines, which have been closed during this period. In 1981 the nickel ore extraction was mainly situated in four big mines: Thio, Poro, Népoui and Kouaoua. The mines Poro, Kouaoua and Népoui are situated on the east coast of New Caledonia not very far each from the others. Only Népoui is situated on the west coast, where the new factory Koniambo is situated nowadays. Even though the nickel ore production decreased in all four mines in general from more than 4 million tons to less than 3 million tons, the share of total production increased from 53% to 72%. During this period the number of opened mines decreased to less than 25%. Only the main mine Kouaoua kept almost the same sum of production, without any dramatic decline. All the time there was an absolute dominancy of nickel mining industry. At the end of 1970's it was representing over 91% of exports of New Caledonia. More than 83% were represented by the main nickel company SLN, which held more than 82% of total Caledonian export.

**Figure 4: Nickel Ore Production in New Caledonia in 1971 (total production 7,720,000 tons)**



Source: United Nations University, 2010

**Figure 5: Nickel Ore Production in New Caledonia in 1981 (total production 3,980,000 tons)**



Source: United Nations University, 2010



## **3.7 Nickel mining and processing companies in New Caledonia**

### **3.7.1 SLN (Société Le Nickel)**

The SLN is one of the oldest companies in the processing of nickel, which was founded in 1880 in Paris. The metallurgical factory SLN Doniambo works in continuous operations in the capital of New Caledonia Nouméa. This factory until recently had totally dominant role and was a priceless motor of Caledonian economy and a vital source of jobs. The importance of factory Doniambo has long been completely irreplaceable in the local economy. The SLN is now one of the key players in the nickel industry. The main precondition for the sustainability of the nickel industry is the presence of significant mineral deposits, as well as growth of global demand for nickel.

SLN has extracted nickel ore from its mines located throughout the Grande Terre for more than 135 years. The company has become an expert for the transfer of metal through a pyro metallurgical process for more than 105 years, which gives it has a strong background. This long term involvement and historical experience of Caledonian furnace maintain sustainable vision of SLN as a main nickel and processing company of New Caledonia and strengthen its position as a leader of metallurgy in New Caledonia. The process of mining of the natural resource must respect the highest standards in the areas of safety, environment and technology, in order to share the benefits with our stakeholders and shareholders.

The 4 major missions SLN:

- Innovate and adapt to meet production targets and maintain the quality of products sold, despite a continued decline in ore grade and international competition,
- The daily commitment of teams, with a concern for safety,
- Compliance with the most stringent environmental standards and the exceptional biodiversity of New Caledonia, in the context of a sustainable development policy,
- Deep integration into the fabric of the Caledonian society, historical partner of New Caledonia. (SLN, 2013)

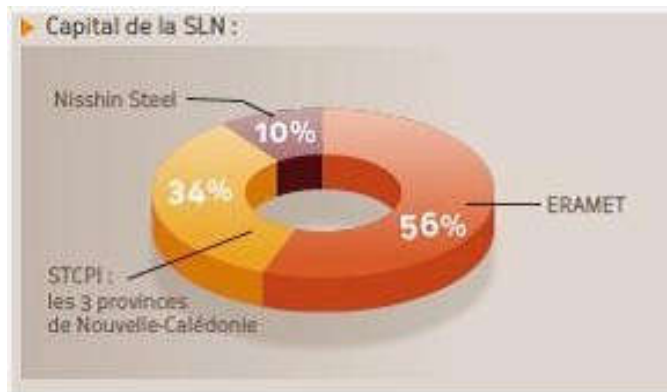
It is also important to mention the importance of Doniambo factory in the context of the historical events that happened during the first half of the 20th century. "The export of nickel do not accrue during the Second World War and its price rather stagnated, factory SLN

controlled more than 75% of the market with nickel. Factory Doniambo was the flagship of SLN company and the largest private employer and a holder of 75% of mining reserves of the country. Production of SLN was at that time 100 thousand tons per year, compared to only 7 thousands of tons produced by Canada." (SLN, 2008)

Mined nickel was sent by sea to the refinery SLN located in the port of Le Havre. The Second World War then interrupted maritime transport between France and New Caledonia. Needed boost of economic situation does not come with the end of the war.

Mining equipment was not used and maintained during the war and therefore it is very expensive to bring it back into operation. Lack of funds makes in addition impossible to buy Australian coal, which is needed for their re-launch. This situation results the economic decline and long-term economic stagnation. The impact of the economic crisis in the mining and processing of nickel very significant over the next four decades of the postwar period.

**Figure 6: Percentage shares of companies in Société Le Nickel**



Source: SLN, 2016

In the figure above we can see the shares in SLN company. The main share belongs to Eramet Group, which holds about 56%. SLN's main customer Japan company Nisshin Steel has 10% share of SLN. The most important owner for me is STCPI, which holds 34% share of SLN. STCPI is a company composed from two Caledonian companies, which are representing three Caledonian provinces.

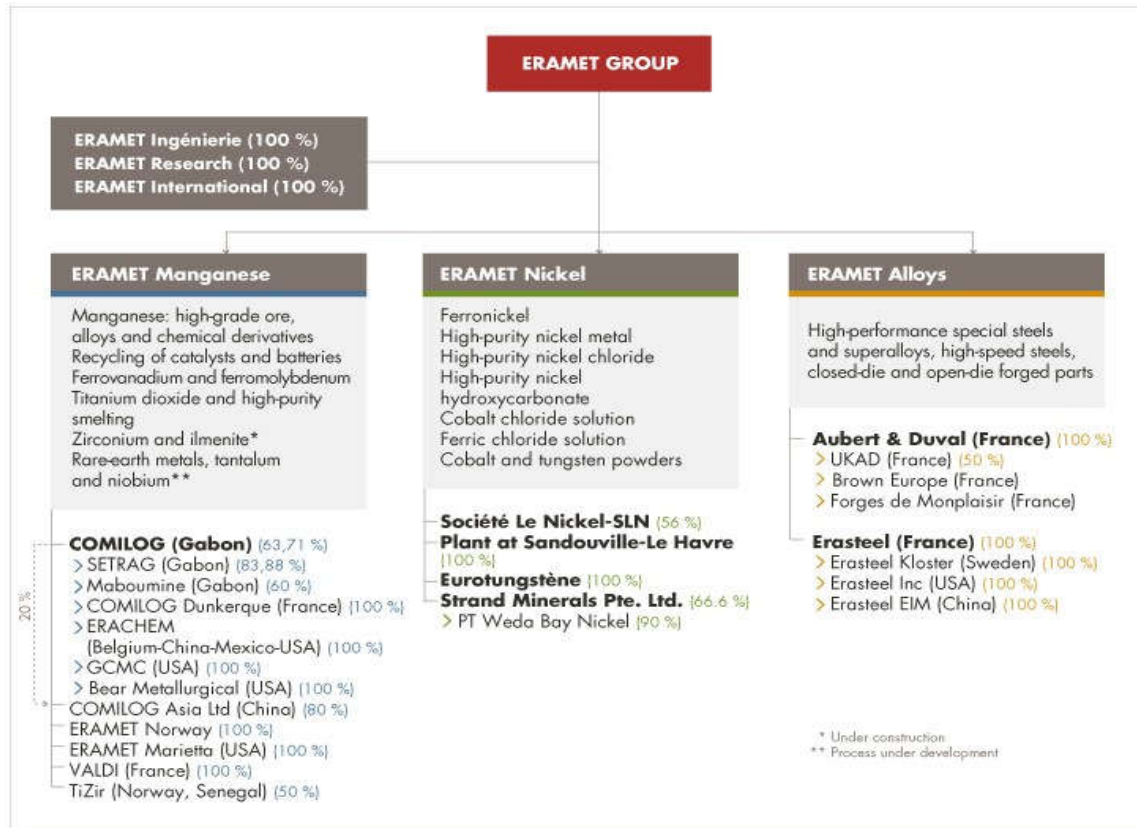
STCPI consists of Promosud, who represents the Southern province and has a 50% share and company Nordîles representing the province of Loyalty islands and the Northern Province with remaining 50% share. STCPI holds also 4% of the shares of the ERAMET group.

The New Caledonia and has four representatives on the board of the SLN and two representatives to the ERAMET to directly participate in the major decisions of the company, in the interest of all and with constant attention to north-south rebalance. STCPI supports the development of the SLN and advises in its handling of social problems. It's important to mention, that every year STCPI receive dividend, based on the economical results. It's determined for the benefit of the entire local population. STCPI redistribute the profit from dividends between all three provinces, it's divided for the benefit of the Northern province and the province of the Loyalty Islands, where are not located any nickel mines. STCPI has already redistributed around 330 million euros of dividends since 2000. (SLN, 20016)

The shareholders' agreement within the SLN, between STCPI and the ERAMET Group was renewed. Both parties decided, by mutual agreement, extend it for a further period, until 31 December, 2016.

In the figure below we can see a structure of Eramet Group. Eramet is not only concerned in nickel production, which is only one part of its activities. Eramet also operates mines for manganese in Gabon and runs plants for its further processing in USA, China or Norway. SLN is not its only plant for nickel handling. Eramet also owns a majority share of a plant in Weda Bay in Indonesia. Plant in Weda Bay is one of the main plants in Indonesia. Indonesia produced 170,000 tons of nickel in 2015, notwithstanding it was 440,000 tons in 2013. (Statista, 2016) Another part of Eramet's portfolio are alloy companies in France, USA and China for development of high performance steels.

**Figure 7: Eramet group portfolio**



Source: Eramet, 2016

The company Eramet brings out SLN from this crisis. Eramet is an important metallurgical-mining company which is specialized in the processing of nickel and manganese. There is a dramatic increase in the demand for nickel between 1950 and 1980. The growth of around 7% per year is mainly due to strong demand for high-quality stainless steel in all industrial sectors such as the chemical and food industry, transport and construction. (SLN, 2013)

Eramet's goal is to ensure long-term supply. There are needs of metals in emerging countries, which are growing, but high grade deposit discoveries are rare and minors must deal with more complex deposits and grades of lower and lower. The mechanical progress continues and nowadays company can work with ore, which contains only from 1.6% to 2.5% of pure nickel. Eramet's main core competence is innovation and developing its expertise in hydrometallurgy to promote the competitiveness of the group in the valuation of nickel.

Eramet consumes much less energy than during the pyro metallurgical process. The impact on environment is very important, so company emits very little CO<sup>2</sup>, so company has to consider the technologies, which is going to be used. Eramet Group tries to identify the activities, which may have a negative impacts on the environment and to avoid them or reduce, if it is possible. Hydrometallurgy is used to extract and separate more straightforwardly the different metals from ore and makes economic valuation of ore at lower levels. Eramet expand the supply of strategic materials like nickel, which requires very specific development on the upstream but also downstream side. Eramet Group conducts investment to diversify its offering and meet the needs of newly developed sectors. It is a must to develop highly sophisticated products, which are more efficient. Hi-tech industries need progressively more efficient materials: resistant, low energy consumption, reliable, competitive. Eramet invests in research and development on the development of hydrometallurgical, pyro metallurgical, mineral processing, or on technologies classification. (Eramet, 2016)

Responsibility is one of the crucial factors for finding the equilibrium between mining industry and sustainable development. Eramet set up goals for sustainable development at all sites to operate upstream and to integrate sustainable development in all projects for exploitation of new deposits. The Group has also established health and safety requirements. Group contributes to scientific development of metals and on the identification of potential risk management measures and on health and the environment. Eramet participates on consideration in terms of biodiversity and on international contribution for avoidance, reduction and compensation of ecological impacts, caused by nickel mining.

Especially for New Caledonia is important the process of innovative technical revegetation. How I mentioned before, the nickel mining manners have a huge impacts on the surface of Caledonian countryside. Nickel mining in New Caledonia began in 19<sup>th</sup> century and since then the landscape has changed dramatically. SLN is involved in the rehabilitation of sites, where operates for more than thirty years. SLN initiated revegetation work in 1993, which has helped to treat more than 160 hectares of Caledonian countryside, which was devastated due to nickel mining.

SLN has reorganized the replanting activity to significantly increase the area of the treated surfaces and has improved the quality of actions since 2010. It has consequently

strengthened its cooperation with the local company SIRAS Pacific, with whom SLN has industrialized a method of revegetation by hydro seeding. (Eramet, 2016)

It is evident that this development has strengthened the role of SLN in the industrial market and confirmed its dominant position. New Caledonia remains only an intermediate processor in spite of a significant increase in mining. Mined nickel continues to be transferred to the French port of Le Havre, where nickel is further processed into finished products. This should help speed up production of ferronickel, which serves as a sort of intermediate in the production of stainless steel, while the modernization of the industrial sector will be maintained. The final product becomes a high-quality steel, which is highly demanded in the market. This axis of nickel processing on the one hand helps to accelerate and improve the process and broad international cooperation, but on the other hand reduces the profit of New Caledonia, which would have been higher if the product was processed only in New Caledonia.

The fact, that mining anticipated favorable growing development and did not count as the cyclical nature of final demand for nickel, shows itself as a further lack of established system. Excess of supply resulted a decrease of the total price of nickel, which negatively affected the economic situation of New Caledonia. This leads to economic hysteresis, which depends not only on the current state, but also on the preceding situations. Therefore you cannot simply and quickly respond to the current situation and reduce or increase the volume of production. This results into a constant fluctuation of the price of nickel, which has a hard impact on the economy of New Caledonia in the period between years 1975 and 1987.

The price of the metal dropped by 43% during one year. The French mining group is the holder of huge deposits of nickel in New Caledonia. Nowadays hard times begins for the three main Caledonian plants Glencore, Vale and Eramet. The quarterly revenue of Caledonian nickel division of Eramet Group was only 146 million euros. It represents a decline by 33% (71 million) in comparison with the same quarter in 2014, when the revenue was 217 million euros. Company has planned the construction of a new modern factory since 2007. The project has been postponed because of the lower production costs of the nickel plant Doniambo in Nouméa and still decreasing prices of nickel. The sales of Alloys Division rose by 3% to 218 million while those of the Manganese Division in Gabon rose by 5% to 375 million. Anyway in a global environment the commodity prices are at their lowest level

in 15 years, Eramet must maintain its financial liquidity of € 1.8 billion. "Beyond the current crisis of metals, largely linked to the evolution of the Chinese economy, the Group's markets remain fundamentally holders over the long term," said the French group in a statement. (Outremer1ere, 2015)

### **3.7.2 Koniambo**

Pro-independence leaders observe economic autonomy as a precondition for political liberation of New Caledonia. The Koniambo Project has been formed as a joint venture between a Suisse Glencorne group and Caledonian Mining Society of the South Pacific (SMSP). The independence supporters, wanted to lose an economic dependency on metropolitan France. Before Koniambo project local Caledonian inhabitants didn't gain a lot from nickel mining, because the production of the main nickel company SLN was governed from metropolitan France. The resource extraction has underprivileged local groups, what resulted in an intensive demand for a political rights of New Caledonia. The Koniambo Project was formed as a result of complaints for an unbalanced nickel redistribution from pro-independence activism.

Violent rebellions in the middle of 1980's ended with accords, which were promising an economic development. Radical activists believed this would pave the way for independence while their opponents hoped to avoid such ambitions. The Koniambo Project is also viewed either as an opportunity for larger Kanak autonomy or as a muting of pro-independence requirements by series of actions, which will give the economic gains from nickel production to Caledonian government authorities (Horwitz, 2004)

Signing of Matignon agreements in 1988 entitled the Kanakas to share the management of extractive resources. The fulfillment of this resolution occurs about ten years later, when was approved the construction of another huge metallurgical plant Koniambo. Construction began in 2008 and the opening of plant and the first production started already in 2012. Koniambo was built in the Northern province, which is not as economically developed as the southern province, and there is high unemployment.

Koniambo project was officially launched in April 1998, when the company Falconbridge became an official partner of the Caledonian mining company South Pacific (la Société Minière du Sud Pacifique - SMSP). This important signal is significant promise for

the future development of New Caledonia, because the majority owner of the factory Koniambo became Caledonian general public. The agreement between companies' states that SMSP has a 51% share in the joint venture plant Koniambo Nickel SAS (KNS) and its mission is to provide professional staff and the choice of location. Falconbridge has a 49% share, provides professional project feasibility study and any financial guarantee (1.5 billion dollars) needed to build the future joint venture. (Koniambonickel.nc, 2013)

The Mining Society of the South Pacific (SMSP) is a subsidiary of the Company of financing and investments in the North province (SOFINOR), the financial arm of the North Province and Loyalty Islands Development Corporation (SODIL). SMSP is a mining company with metallurgical balance, which owns 51% of each of the joint ventures from industrial partnerships, which were developed. So SMPS owns 51% of the joint venture company Koniambo Nickel SAS (KNS) the remaining 49% are held by Suisse company Glencore Xstrata. The joint venture was created for treating garnierite from the Koniambo massif. SMSP has also 51% share in another two joint ventures Nickel Mining Company SAS (NMC) and Nickel Company of New Caledonia and Korea Co Ltd (SNNC), The remaining 49% are owned by the South Korean steelmaker POSCO. This partnership the processing of garnierite from poor mining centers in Korea. SMSP also holds 51% in the joint venture Caledonian Chinese Mining Company SAS (CMAC) in partnership with the Chinese company Jinchuan for laterite ore processing project. (Koniambo, 2016)

The second shareholder is Glencore Xstrata, which is one of the largest expanded companies in natural resources. The company is divided into three separate sectors. The first one is metal and mineral extraction, company is mainly concentrating on copper, nickel, zinc, aluminum and iron ore, Glencore is an action owner of activities which include mining, smelting, purifying and storage maneuvers. The second segment of Glencore's interest are energy products. Glencore also facing exploitation, conveyance and storage of petroleum and coal. The last section is oriented to agricultural products. Glencore also invests into agricultural products such as grains, oil, cotton and sugar. Glencore group owns mines and processing facilities in Canada, the Dominican Republic, Australia and Norway, so the Nickel Division of Glencore holds a portfolio of many ventures like in New Caledonia. Glencore has become the fourth largest manufacturer of nickel in the world with annual production of



nearly 143,000 tons of refined nickel. The subsidiaries of the group sell very pure nickel and ferronickel, thanks to modern processing technologies. (Koniambo, 2016)

New Caledonia owned only 10% of shares of plant Goro and from the factory SLN Doniambo even nothing at all. The project to build a factory is completed in December 2004 and the joint stock company Koniambo Nickel was finally created in 2005. Since 2004 there has been a strong trend of concentration in the mining industry because of soaring global commodity prices. Large mining companies were looking for ways to increase its production capacity and finding new mining opportunities and therefore some of them tried to purchase company Falconbridge.

Falconbridge was finally taken over by the company Xstrata in August 2006. Xstrata Nickel conducted a review of the project after joining the company Koniambo Nickel. It took almost all year. The reason was mainly the review of construction costs strongly affected by rising commodity prices and the redefinition of the project and financial optimization strategy. The final version of the project was completed and approved by report on the renewal of project was in October 2007. The original studies determined the project cost of 2.2 billion USD in a total. The total amount of funds, to implement the project Koniambo, was established on \$ 3.8 billion USD. The project was financed jointly by both partners. Factory Koniambo finally started production in 2012. (Guichet unique VKP, 2013)

The biggest crisis of Koniambo plant happened in December 2014, when there was a leak in one of the two furnaces, which releases metal on a slab provided for this purpose. The molten metal heated to 1,500 degrees has leaked from the oven, because of a problem at the refractory. Behind its original schedule, the Koniambo plant encountered technical problems in particular at its power plant production was expected to produce 14,000 tons of nickel in 2014. Production for 2015 was set at 30,000 tons but this accident should jeopardize this goal. Full production capacity of 60,000 tons per year should be reached during a first half of 2016. The official economical results for 2015 haven't been announced yet, but from official half year report below we can see that the expected results couldn't be achieved. The unit, which operates one of the best deposits in the world of nickel ore, essential for stainless steel production, has experienced significant inflation of the investment cost. Glencore groupe estimated the costs for 7 billion dollars (€ 5.7 billion). (Sciencesetavenir, 2014)

From Glencorne half year production report we can see, how any change in production of Koniambo plant has an significant impact on a nickel production of whole Glencorne groupe. The total production of nickel assets from own sourced nickel production of Glencorne group in first half of 2015 was 48,900 tons. It represents decline of 6% in comparison with second half of year 2014. The reason of this diminution in comparison with second half of year 2014 is the metal leak at Koniambo in December 2014 and following reduction of nickel production. Integrated Nickel Operations from own sourced nickel production were 26,300 tons, representing a 4% breakdown in comparison with previous period, reflecting the use of supplementary third part material to create an optimal blend for smelting. Total nickel production including third part material was 45,500 tons, it's 2% more than in previous period. Repairing works of Koniambo plant continue following to the metal leak in December 2014. Koniambo produced 4,900 tons of nickel in ferronickel in first half of 2015, it's a dramatic fell down from 8,500 tons in second half of 2014. The corrective works remains to progress in line with expectations. Till 30 June 2015 incremental net operating costs, along with those costs related to the damaged plant and equipment were \$235 million, which are estimated to be recognized as an expense in the interim accounts. (Glencorne, 2015)

### **3.7.3 Goro - Factory of the Great South**

New Caledonia is nowadays in nickel recession due to declining prices of nickel and due to decreased demand for the metal mainly from China and India. The situation has changed fundamentally! New Caledonia doesn't want only to export its mineral wealth into France, but requires to obtain more profits from mining nickel. Natural resources should remain on the territory and avoid to escape of the Caledonian national wealth. New Caledonia established two completely new metallurgical plants Goro Nickel in the south of the proximately the same production size as Koniambo in the north of Grande Terre.

The factory Doniambo SLN was the only mining factory in the territory of New Caledonia all over the century from 1902. Canadian mining giant Vale Inco begins in 2003 huge project of construction of a hydrometallurgical plant, located in the extreme south of Grande Terre.

Goro factory has a production capacity of 60,000 tons of nickel and 5,000 tons of cobalt, it is the technological revolution in the world of nickel. Its impact on the economy of New Caledonia and the region is huge. Factory Goro should create more than 4,000 jobs over time, what is about 5% of the economically active population of the southern province, and employ preferably original kanak population. The expected impact on the gross domestic product of the New Caledonia is estimated at more than 10%. Factory Goro has launched a trial mining and industrial production in 2010, full production is expected until this year 2014. The majority owner of the factory Goro is a company Vale Inco, which holds 69% of shares, the provinces of New Caledonia have together a combined share of 10%. (Vale, 2012)

The project went through many difficulties. The construction, which should originally start in 2004, was delayed because of a number of political, environmental and economic problems. Construction of factories required the destruction of seven hectares of forests, which could not be done without government approval or without an agreement with the local tribes. The factory Goro is located at the southern end of the Caledonian lagoon and there is a potential danger of hurricanes. This could be the future problem, because New Caledonia is often hit by cyclones.

The Goro project, which is expected to become the world's largest nickel mine, is designed to produce as much as 60,000 tons a year of nickel and 4,600 tons of cobalt a year.

The project's output would then be 3.5 percent of estimated global output of about 1.7 million tons of nickel in 2012. Goro's start-up was delayed several years and costs soared to more than 4 billion dollars from 1.9 billion dollars, after protests by local islanders raised environmental concerns and soaring commodities prices boosted equipment and engineering costs. (Vale, 2012)

It is also important to mention the environmental impact of the project on the environment. The Vale Inco plans to discharge wastewater directly into the Caledonian lagoon. This was the subject of fierce controversy between factory management, environmental groups and local residents. The country is facing environmental pollution with real consequences on the health and environmental impact remains uncertain, because the hydrometallurgical process has never been applied in similar conditions.

The Vale Inco has committed to fulfill the discharge standards applicable internationally and regularly measure the level of toxic or dangerous substances near factories and mines, including pipelines and wastewaters. Vale also planned to complete the rehabilitation of mining sites using local endemic species.

## 4 Analytical part

### 4.1 Nickel production and price development

Present situation on nickel market is not very optimistic. New Caledonia has been directly affected by the nickel price collapse, the economic heart of the archipelago of New Caledonia holds its breath. Caledonian three metallurgical plants, at the hands of French and international operators, are nowadays in big uncertainty. Nowadays we are in period of recession, even though New Caledonia became the real world leader in nickel extraction. Nickel extraction is depending on the application and ultra-modern very powerful methods.

The main reason of decreasing prices is a decline of stainless steel production. The new refineries for nickel production were opened in Madagascar and Canada and also a dynamic increase of production in ferronickel plants in Brazil and New Caledonia. Nowadays there is oversupply of nickel and price is down. Even though the nickel companies continue their innovation processes and research and they're planning new projects in the belief that there will be a future positive change in the global nickel demand.

**Table 1: World mine nickel production divided by country in 2014 and 2015 (tons)**

	Mine production	
	2014	2015 <sup>e</sup>
United States	4,300	26,500
Australia	245,000	234,000
Brazil	102,000	110,000
Canada	235,000	240,000
China	100,000	102,000
Colombia	81,000	73,000
Cuba	50,400	57,000
Guatemala	38,400	50,000
Indonesia	177,000	170,000
Madagascar	40,300	49,000
New Caledonia	178,000	190,000
Philippines	523,000	530,000
Russia	239,000	240,000
South Africa	55,000	53,000
Other countries	<u>377,000</u>	<u>410,000</u>
World total (rounded)	2,450,000	2,530,000

Source: USGS, 2016

The production of nickel increased in 2015 in comparison with previous year 2014, even though the price fell down. World nickel production augmented from 2,450,000 tons in 2014 to 2,530,000 tons on 2015, it represents an annual rise by 3.27%. If we look at results of New Caledonia, the production also increased from 178,000 tons to 190,000 tons. It represents an annual growth by 6.74%, which is around 3.5% above the world average.

**Table 2: Production of mineral commodities in New Caledonia from 2009 to 2013 (in tons)**

NEW CALEDONIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013
Cement	140,173	161,236	147,761	123,668	125,000 <sup>e</sup>
Nickel:					
Ore:					
Gross weight thousand metric tons	5,689	8,709	8,835	9,659	11,967
Co content	2,000	2,850	3,240	3,500	3,190
Ni content	95,649 <sup>f</sup>	131,309 <sup>f</sup>	128,732 <sup>f</sup>	131,693 <sup>f</sup>	163,866
Ferronickel:					
Gross weight	156,553 <sup>f</sup>	165,506 <sup>f</sup>	169,513 <sup>f</sup>	184,476 <sup>f</sup>	170,000 <sup>e</sup>
Ni content	38,230	39,802	40,015	43,030	40,459
Nickel matte:					
Gross weight <sup>e</sup>	18,600 <sup>f</sup>	18,600 <sup>f</sup>	18,400 <sup>f</sup>	17,900 <sup>f</sup>	17,700
Ni content	13,902	13,917	13,780	13,417	13,279

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. <sup>f</sup>Revised.

<sup>1</sup>Table includes data available through December 5, 2014.

<sup>2</sup>In addition to the commodities listed, chromite, copper, crushed stone, gold, iron, manganese, silica sand, and silica are produced, but available information is inadequate to make reliable estimates of output.

Source: USGS, 2015

In the figure „New Caledonia: Production of mineral commodities“ we can see the nickel production in New Caledonia from 2009 to 2013. In comparison with previous years the production grew up only in nickel ores, which are the less sophisticated intermediate. The production of ferronickels and of the nickel matte started to slightly decrease. We can see new politics of nickel companies, which are starting to export more nickel ore for the further processing in foreign countries to eliminate their financial loss, caused by a enormous depreciation of nickel price. The procedure of creation of ferronickel or nickel matte is very expensive and complicated, how I have described in the chapter Ferronickel & nickel matte production. Nowadays when the nickel market is oversaturated, companies have to bring new market strategies to gain a competitive advantage ahead of the other competitors.

The figure „New Caledonia: Structure of the mineral industry in 2013“ shows us the nickel production in New Caledonia in 2013 in details. You can see the major operating companies, with a division of shares, locations of mining facilities and the annual capacities.

**Table 3: New Caledonia: Structure of the mineral industry in 2013 (in tons)**

NEW CALEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Cement	Tokuyama Nouvelle Calédonie S.A. (Tokuyama Corp., 74.1%)	Grinding plant, Noumea	200,000
Cobalt, in ore and concentrate, Co content	Société le Nickel (SLN) [Eramet Group, 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Kouaoua, Nepoui-Kopeto, Poum, Thio, and Tiebaghi mining centers	3,000
Do.	Vale S.A., 80.5%; Sumitomo Metal Mining Co. Ltd., 7.6%; Mitsui & Co. Ltd., 6.9%; Société de Participation Minière du Sud Calédonie S.A.S. (SPMSC), 5%	Goro, 58 kilometers east of Noumea in South Province	4,600
<b>Nickel</b>			
In ore and concentrate, Ni content	Société le Nickel (SLN) [Eramet Group, 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Kouaoua, Nepoui-Kopeto, Poum Thio, and Tiebaghi mining centers	55,000
Do.	Société Minière du Sud Pacifique, 51%, and POSCO, 49%	SMSP laterite operation in South Province	31,000
Do.	Société des Mines de la Tontouta, 100%	Moneo and Nakety mining centers	50,000
Do.	Other small nickel mining companies, including Société Minière George Montagnat SA (SMGM)	Tontouta mining center	1,000
Do.	Vale S.A., 80.5%; Sumitomo Metal Mining Co. Ltd., 7.6%; Mitsui & Co. Ltd., 6.9%; Société de Participation Minière du Sud Calédonien SAS, 5%	Goro, 58 kilometers east of Noumea in South Province	60,000
In ferronickel, Ni content	Société Minière du Sud Pacifique (SMSP), 51%, and Glencore plc, 49%	Koniambo open pit 13.3 kilometers west of Kone in North Province	60,000
Do.	Société Le Nickel (SLN) [Eramet Group, 56%; Société Territoriale Calédonienne de Participation Industrielle (STCPI), 34%; Nisshin Steel Co., 10%]	Doniambo, Noumea	60,000
In nickel matte, Ni content	do.	do.	15,000

<sup>e</sup>Estimated. Do., do. Ditto.

Source: USGS, 2015

On the Grande Terre, where is still nickel mining situated mining, the decline of the demand on the world nickel market weighs about 10% of Caledonian GDP and more than 4,500 direct and indirect jobs positions are in danger of a dismissal. Even though nickel is an essential to stainless steel manufacturing, the decline in Chinese growth is one of the main reasons of the nickel price collapse, which has decreased by almost 40% in comparison with

last year. Nowadays the average nickel price is around 8,500 dollars per ton.<sup>1</sup> China is one of the main Caledonian nickel subscribers. When the economical Chinese boom slows down, China's nickel demand for nickel is not so high like during previous years. The problem is that Caledonian nickel companies were accustomed to higher demand.

Nickel plants has produced enormous stocks. The world nickel stocks in LME are little bit less than 450,000 of tons.<sup>2</sup> The production costs are high, so Société Le Nickel (SLN) is on the edge. The largest private employer in Caledonia has recorded 260 million euros of losses in 2015, after three previous years already in the red numbers. The French group Eramet has awarded its subsidiary Caledonian advances of 150 million euros since December, ensuring survival of the company until June. With the approach of a selfdetermination referendum, to be held at the latest in 2018, the state fears the combination of a sensitive political maturity and a degraded social context, which could jeopardize the fragile peace of the archipelago. (Outremers360, 2016)

The nickel price is a not very stable. We can a massive drop of a nickel price during 2015. In January the price was on London Metal Exchange (LME) 14,767 dollars for a ton of 99.8% pure nickel. The situation has changed and in September the price was only 9,895 dollars, what represents a decline of 33%. Even though the price went down the year 2015 reached record heights, when in LME warehouse were stocked 423,000 tons of pure nickel in October. We can see that fluctuation of prices per metric ton of nickel is really huge. In only 9 months there is a decline of 33% in price of nickel.

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<sup>1</sup> The nickel price on 23<sup>rd</sup> March 2018 = 13,040 USD/ton (Source: infomine.com)

<sup>2</sup> The LME stocks on 23<sup>rd</sup> March 2018 = 433,110 tons (Source: infomine.com)



**Figure 8: Development of nickel price from 1<sup>st</sup> January 2007 to 26<sup>th</sup> March 2018**



Source: LME, 2018

**Figure 9: Development of nickel price from 1<sup>st</sup> September 2014 to 26<sup>th</sup> March 2018**



Source: LME, 2018

These two charts show us the development of nickel price since 2007, when it reached its historical maximum. We can see that the nickel price is very unstable. In 2007 the price for one ton of nickel was nearly 55,000 dollars per ton. Today, only 9 years later, the price was only little bit more than 7,700 dollars per ton on 11<sup>th</sup> February 2016. It's incredible that the price was reduced 7 times. There are many reason for it, the financial crisis hit the industry heavily and the nickel industry reached today's values in 2008 and 2009. Afterwards the price begun to rump up again and almost touched 30,000 dollars per ton in 2011. Then the price continues to slightly decrease, only in the middle of the year 2014 there was a short upswing.

Nowadays nickel market price started to increase again, but it's a very slow and long term process. The current price on 22<sup>nd</sup> March 2018 is 13,350 dollars per ton. The price is the most stable in a modern history. The main reasons are stable demand for nickel and also the volume of world nickel production in general, which has already stopped to grow up. We can't expect a dramatical enhancement of nickel price.

One of the world biggest supplier from New Caledonia Vale is going to cut down it's nickel production by 15% in 2018, the company also announced that they started to search for a new investor for its New Caledonia nickel mine. (Investingnews, 2017)

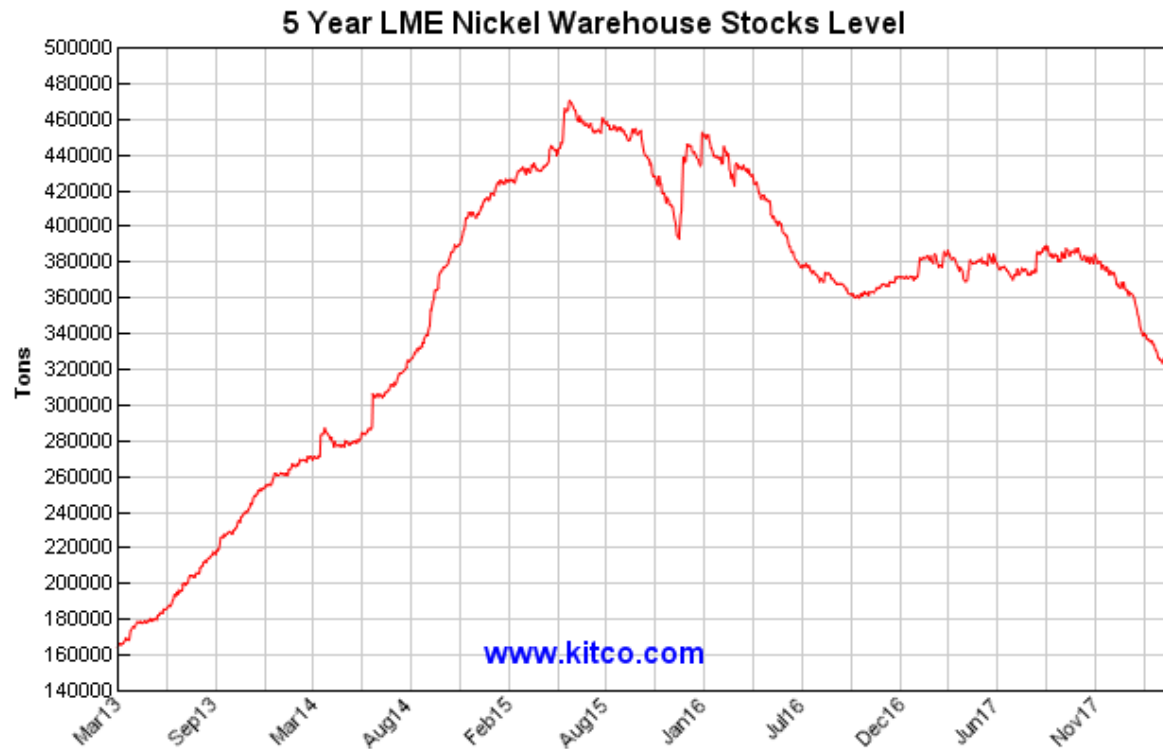
That is an interesting news, because this is definitely going to influence the world market nickel price. The prediction is that the price is going to move around 15,000 dollars per ton in next two years.

## **4.2 Correlation analysis**

Another problem is relating to nickel stocks on London Metal Exchange. How it was already mentioned before, the stocks reached record highs in 2015, when the maximum stocks attacked the value of 470,000 tons. Today the value of total stocks is stagnating, but it's very important to see a rapidity of this storage process. The stock values were only around 9,000 at the beginning of 2012, they have decreased more than 9 times in only four years. The nickel market is oversaturated, companies have to find new strategies, how to develop their own businesses and save their market share. I personally don't think that the situation will get

better in the near future. Companies should focus to their competitive advantages to reduction of cost during a production process to devoid the possibility of bankruptcy.

**Figure 10: Development of stocks of nickel in LME in last 5 years**



Source: Kitco, 2018

In Table 4 we can see development of official prices of various metals, which are similar to nickel, during last 12 months on London Metal Exchange. Author is going to use correlation analysis to prove very high positive correlations between prices of different metals. It means that prices affect each other.

**Table 4: Official LME prices (dollars/ton) from April 2017 to March 2018**

	Aluminium	Zinc	Copper	Lead	Nickel	Tin
LME Cash - Settlement	(dollars/ton)	(dollars/ton)	(dollars/ton)	(dollars/ton)	(dollars/ton)	(dollars/ton)
March 2018	2 076,52	3 280,48	6 795,76	2 397,00	13 403,57	21 214,05
February 2018	2 184,93	3 539,78	7 001,80	2 580,82	13 576,75	21 693,50
January 2018	2 214,50	3 447,20	7 080,30	2 589,77	12 880,23	20 710,68
December 2017	2 070,74	3 192,47	6 801,16	2 508,82	11 409,21	19 440,00
November 2017	2 101,02	3 236,16	6 825,57	2 464,41	11 992,73	19 574,55
October 2017	2 130,41	3 273,95	6 797,39	2 506,30	11 325,00	20 468,86
September 2017	2 100,48	3 119,79	6 583,19	2 377,29	11 233,57	20 855,48
August 2017	2 030,09	2 981,84	6 478,18	2 357,32	10 852,95	20 570,00
July 2017	1 903,62	2 785,10	5 978,60	2 266,40	9 481,67	20 272,86
June 2017	1 886,61	2 571,93	5 699,48	2 131,18	8 930,68	19 701,82
May 2017	1 912,15	2 589,38	5 587,83	2 135,30	9 158,25	20 212,00
April 2017	1 930,94	2 633,03	5 697,67	2 231,31	9 668,61	19 991,39

Source: Westmetal , 2018 (author's own processing)

**Table 5: Correlation matrix of LME prices of different metals**

LME Cash - Settlement	Aluminium	Zinc	Copper	Lead	Nickel	Tin
Aluminium	1,000000	0,965700	0,951844	0,949536	0,900628	0,500511
Zinc	0,965700	1,000000	0,982012	0,966023	0,949764	0,526815
Copper	0,951844	0,982012	1,000000	0,963760	0,917917	0,414656
Lead	0,949536	0,966023	0,963760	1,000000	0,868768	0,374742
Nickel	0,900628	0,949764	0,917917	0,868768	1,000000	0,610865
Tin	0,500511	0,526815	0,414656	0,374742	0,610865	1,000000

(author's own research)

Correlation matrix in Table 5 proves us very high correlations between prices of different metals, how we expected. There is one exception of tin, which has the lowest correlations with other metals, but the correlations are still significant. The market price of nickel has the highest correlation with Zinc and the lowest one with Tin. Unfortunately we are not able to see, which price is the cause and which one is the effect.

In Table 6, there are London Metal Exchange stocks in tons of different metals during last 12 months. Author will try to find some interesting correlations between these stocks. We cannot expect some high correlation like it was with market prices. There could be some negative correlations, when a diminution of stocks of one metal may influence an increase of stocks of another one.

**Table 6: LME stocks (tons) from April 2017 to March 2018**

LME Stock	Aluminium (tons)	Zinc (tons)	Copper (tons)	Lead (tons)	Nickel (tons)	Tin (tons)
March 2018	1 298 430	200 479	330 913	131 255	327 055	1 766
February 2018	1 215 638	153 439	324 908	121 990	341 650	1 859
January 2018	1 090 019	179 268	232 620	140 164	363 904	2 066
December 2017	1 103 876	195 729	195 645	143 991	375 277	2 340
November 2017	1 153 811	231 274	242 043	146 414	381 572	2 145
October 2017	1 220 525	262 465	286 882	152 268	385 331	2 063
September 2017	1 306 655	255 619	266 687	160 330	383 605	1 979
August 2017	1 311 060	254 001	271 516	149 913	380 656	1 869
July 2017	1 377 414	273 356	306 830	157 867	374 063	1 929
June 2017	1 441 664	313 317	272 139	174 697	377 252	1 841
May 2017	1 543 734	342 080	325 394	179 858	380 426	2 255
April 2017	1 751 213	360 449	265 794	170 888	375 819	3 277

Source: Westmetal, 2018 (author's own processing)

**Table 7: Correlation matrix of LME stocks of different metals**

LME Stock	Aluminium	Zinc	Copper	Lead	Nickel	Tin
Aluminium	1,000000	0,873568	0,389659	0,720022	0,168161	0,574476
Zinc	0,873568	1,000000	0,156973	0,940742	0,567345	0,523322
Copper	0,389659	0,156973	1,000000	-0,006793	-0,459562	-0,308253
Lead	0,720022	0,940742	-0,006793	1,000000	0,691783	0,406334
Nickel	0,168161	0,567345	-0,459562	0,691783	1,000000	0,301931
Tin	0,574476	0,523322	-0,308253	0,406334	0,301931	1,000000

(author's own research)

The correlations between stocks are very interesting, how we can see in Table 7. Nickel stocks have the strongest positive correlation with Zinc, which has the highest positive correlations with almost all metals. Surprisingly nickel stocks have the highest negative correlation with copper (-0,459562), what is the most unexpected outcome of this research.

**Table 8: Corellations between LME official prices and LME Stocks of different metals**

LME Cash - Settlement/	Aluminium	Zinc	Copper	Lead	Nickel	Tin
LME Stocks	-0,778674	-0,923322	-0,267089	-0,858164	-0,674750	-0,422046

(author's own research)

Table 8 shows us, that there is a negative correlation between official LME price and LME stocks. It proves, when the stocks are decreasing, the price is rising up and vice versa. It is a natural effect, but the interesting fact is that the correlation is quite varied in comparison with different metals.

### 4.3 Regression analysis

The nickel has doubtless an irreplaceable role in New Caledonian economy. New Caledonia is one of the biggest nickel producer in the world. What are the impacts of the referendum on the independence on a market price of nickel? We need to make a regression analysis to answer on this question and find if there is a dependence between the referendum and nickel price on a world market. In a table we can see data from 11<sup>th</sup> October to 27<sup>th</sup> November. There are nickel price with a price of aluminium and a price of tin with a dummy variable. Our correlation analysis showed us a big correlation between prices of industrial metals, so there is a significant influence between prices of these metals. We are using just two of these metals: aluminium and tin, which have lower correlation rate than other metals. We are going to use Dummy variable represents only values "0" and "1", "0" represents data before the referendum and "1" on the contrary represents data after the referendum.

**Table 9: Dataset for regression analysis of official closing day prices of selected metals before and after referendum (dollars/ton)**

Date	Nickel price	Aluminium price	Tin price	Dummy var.
11.10.18	12601.5	2020	19262	0
12.10.18	12579	2041	19113	0
15.10.18	12534.5	2027	19141	0
16.10.18	12516.5	2034	19215	0
17.10.18	12298.5	2022	19088	0
18.10.18	12276	2013	19036	0
19.10.18	12372	2003	19185	0
22.10.18	12447.5	2007	19258	0
23.10.18	12290.5	2001	19341	0
24.10.18	12377	1997	19327	0
25.10.18	12072	1994	19370	0
26.10.18	11834	1998	19345	0
29.10.18	11686	1984	19172	0
30.10.18	11690	1967	19113	0
31.10.18	11425.5	1953.5	19138	0
01.11.18	11718.5	1966	19115	0
02.11.18	11860.5	1973	19110	0
05.11.18	11675.5	1975	19087	1
06.11.18	11699.5	1950.5	19083	1
07.11.18	11743.5	1985	19086	1
08.11.18	11710	1990	19364	1
09.11.18	11397	1954	19189	1
12.11.18	11320	1942	19294	1
13.11.18	11262.5	1935.5	19295	1
14.11.18	11230	1943	19324	1
15.11.18	11182.5	1929	19401	1
16.11.18	11287	1940	19361	1
19.11.18	11108	1934	19635	1
20.11.18	11027	1940	19429	1
21.11.18	10951.5	1953.5	19257	1

22.11.18	10902.3	1946.5	19270	1
23.11.18	10849	1949	18820	1
26.11.18	10803.5	1951.5	18889	1
27.11.18	10700	1930.5	18262	1

Source: Market.businessinsider, 2018 (author's own processing)

**Table 10: Regression analysis with a dummy variable**

<i>Regression Statistics</i>	
Multiple R	0.945219607
R Square	0.893440106
Adjusted R Square	0.882784117
Standard Error	200.5847091
Observations	34

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	10120187.65	3373396	83.84394	1.10198E-14
Residual	30	1207026.766	40234.23		
Total	33	11327214.41			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-21073.0193	4365.624008	-4.82703	3.8E-05	-29988.81299	-12157.226
Aluminium price	13.03920409	1.626355057	8.01744	5.99E-09	9.717743957	16.3606642
Tin price	0.372266546	0.153819928	2.420145	0.02178	0.058124344	0.68640875
Dummy var.	-266.03037	106.6333113	-2.49481	0.018335	-483.804644	-48.256095

(author's own research)

**Predicted Nickel price = -21073 + 13.04\*Aluminium price + 0.37\*Tin price – 266.03\*Dummy variable**



We can see dependency between predicted nickel price on one side and aluminium price, tin price and the dummy variable representing the referendum on the other side. We can see from the table that the regression analysis is significant. The adjusted  $R^2$  is 0.88, what is a high value. It means that the endogenous variable (nickel price) is explained by exogenous variables by 88%. Another important sign of significance is a p-value, which is in all cases lower than  $\alpha = 0.05$ .

We can see that predicted nickel price is equal to  $-21073 + 13,04 \cdot \text{Aluminium price} + 0,37 \cdot \text{Tin price} - 266,03 \cdot \text{Dummy variable}$ . Aluminium price influencing more than thirteen times the nickel price, it is a significant impact, even though the price of aluminium is proximately six times lower than the nickel price. The influence of tin is low (only 0,37), but the tin price is ten times higher than the aluminium price. The most important part of this research is for us a dummy variable. We can see from the equation that a price of nickel decreases by 266, we are after the referendum.

#### **4.4 Future perspectives and possible solutions**

According to the nickel crisis the SLN could increase a capital to support the construction of a new thermal power plant, through a loan assurance and fiscal inducements. The SLN has already postponed its project of power plant in October to lower its costs and to save some financial sources for the replacement of its current unit of aging and highly polluting fuel.

For another plant the financial picture also seems alarming. Companies were increasing their production and now they are standing before essential reductions. The plant of the Great South Goro operated by Vale corporation in New Caledonia has announced 400 million dollars (358 million euros) operating loss for 2015. Company has to reduce its costs by 25% in 2016 to make at least savings of 90 million. The subsidiary of the Brazilian giant has revised the production target for 2016 by 38,000 tons. Its CEO, Darius Khoshnevis has ruled out for now any dismissal, but made it clear that if this serious situation is not going to be changed, all options will be considered. The mothball of the project would be also the possibility, if the situation did not change. (Outremers360, 2016)

The problem of a financial loss has to solve company Swiss Glencore, which owns 49% of the Koniambo plant. The majority is still owned by SMSP (51%), which is held by mining Caledonian company of the independence of the Northern province. Glencore has previously warned that its continuation in New Caledonia is linked to the well running business, company is according to the motto: "If the oven does not work, we will go", how warned the CEO of Glencore Ivan Glasenberg in December. According to unofficial figures, the giant trading and commodities would have lost this year in Koniambo about 268 million euros. The company management has already introduced a stimulus plan, which is mainly concerned on exporting of raw minerals. A relief fund of 16 million euros will be released, and the executive will allow them to sell low grade ore laterites directly into China to offset the shortcomings of traditional Australian client QNI (Queensland Nickel), who is in financial difficulties. (Outremers360, 2016)

#### **4.5. The population of New Caledonia**

To understand the situation, it is necessary to mention the people who live here. New Caledonia is a truly multicultural country. All the residents had already put together in 2014 in favor of the independence of New Caledonia or, conversely, to remain under the authority of France. Each of these groups has a different opinion on the referendum, so it is important to analyze the status, needs and target orientation of the various ethnic groups. In this chapter I will draw from the statistics of the last census, held in 2009.

In New Caledonia in 2009 there were 245,580 inhabitants. The largest community of indigenous Kanak people signed up 40.3%, or 99,100 people of the total population. The second largest community represented in New Caledonia were Europeans in the overwhelming majority of the French, which included 29.2%, which is the equivalent of 71,700 people. The third major group includes residents originally from Wallis and Futuna to 8.7% and 21,300 residents. Other communities represented in New Caledonia together make up 7.3% of the total population: Tahitians (2.0%), Indonesians (1.6%), Vietnam (1.0%), Vanuatuans(0.9%), other Asians (0.8%) and other community (1.0%). Another 8.3% of the population is of mixed blood between different communities called. Metis, 5% refused to

rank among one of the proposed communities, and the remaining 1.2%, its origins not comment at all. (ISEE, 2009)

Another important factor is the uneven distribution of population. In the capital of New Caledonia, Nouméa has about 100,000 inhabitants, the agglomeration of Nouméa, called the Great Nouméa (with neighboring communes Païta, Dumbéa and Mont-Dore), but has only 165,000 inhabitants. We can say that outside the capital is alive only about 80 thousand inhabitants. The capital city and its surrounding area continues to grow mainly due to the influx of immigrants from abroad, but also due to internal migration from Loyauté Islands, from the East Coast and from the northern province. Loyauté islands are the only provinces that are experiencing population decline.

In 2009, three out of four residents of New Caledonia lived in the southern province, and two out of three in the urban United Nouméa. Over the past 13 years, Nouméa has grown by 21,000 persons with a yearly growth of 1.9% of the population annually. Over 70% of immigrants to New Caledonia decides to settle down just in Nouméa. New Caledonia population density is very low (13.2 inhabitants per km<sup>2</sup>) in Nouméa, however, has more than 2,100 inhabitants per km<sup>2</sup>. (INSEE, 2009)

In the southern province are represented most Europeans (35.9%), followed Kanaky (26.7%) and residents originating from Wallis and Futuna (11.4%). Any community living in New Caledonia are more than 90% represented just in the southern province, except Kanaks, which lives here about 50%. In the northern province of 73.8% of the population belong to the Kanak community only 12.7% of the European community. Loyauté islands inhabited solely by Kanaks, of which 96.6% live here. (ISEE, 2014)

## **4.6 Referendum 2018**

In 2018 a long-awaited referendum on self-determination of New Caledonia and its eventual independence was held. In previous chapters author analyzed the political situation in New Caledonia, its powers with regard to the historical timeline, dismantled individual institutions. All such information is necessary to predict the outcome of the referendum. In this his prediction the author comes out not only from above, but also from their own experience and opinion polls inhabitants of New Caledonia, which I myself conducted.

Kanaks are in their opinions inconsistent. All Kanaks in their own way for independence. Part of the Kanak for immediate independence of New Caledonia, hard to bear the sovereignty of France and takes it as an accepted evil that restricts their rights and freedoms. Their only goal is to break away from the "aggressor" and to govern themselves. These views are solely focused on independence, but they lack constructive solution for the future, without any plans for addressing future challenges and routine matters of daily life, which would have alone, unassisted, to solve.

The second part of Kanak population aware of the important fact that, despite a gradually Kanak political elite Kanaks do not have sufficient political experience to the leadership of the country. Eventual independence cannot come overnight, but it must be gradual transfer of remaining powers from France to New Caledonia. This part of Kanak population in the election voted more against independence, but it will require a further transfer of powers.

European, mostly French, the community is divided into two main groups. The first group are called. Zoreille (oreille=ear), which the French are coming with their families from metropolitan France to New Caledonia for several years, mainly for work. This group is clearly against the independence of New Caledonia. In the event of independence they would probably have lost their jobs and they would be forced to leave New Caledonia. In New Caledonia, this group is fairly large population. This is due to the fact that at high professional positions are not sufficiently qualified Kanaks. Therefore, it is necessary to fill these positions qualified people outside the territory of New Caledonia. In New Caledonia, although university, but most sectors ending a bachelor's degree and master's degree does not follow him further. Therefore it is necessary to study travel abroad. Most Kanaks does not want to leave their native Cailou (a small stone: the local name for the Grande Terre) and many of them it my whole life really never leave.

The second group are the so-called European community. Caldoche, a term for the descendants of French immigrants already born in New Caledonia. Caldoche consider themselves native Newcaledonians not a Frenchman. The greatest animosity exists between them and Zoreille, taking as an intruder in their own country. The paradox is that their ancestors were Zoreille who settled in New Caledonia. Caldoche leans more independence. Still do not see the situation only as good and bad, but they recognize that they remain under

France brings certain advantages such as the associate membership in the European Union or free education in France, which if independence came.

Other significant communities living in New Caledonia as Wallis and Futuna or Tahitians derive the same benefits as French thanks to his French citizenship. Therefore, the majority in an election likely to take the side to remain under the jurisdiction of France. In the case of the independence of the immigrants who were born in New Caledonia they were probably just as Zoreille forced to leave New Caledonia. For Wallis and Futons it would be a really big problem because New Caledonia is still alive more than a home on the archipelago.

#### 4.7 Surveys of referendum on the independence

Electoral survey was attended by 139 residents of New Caledonia, of whom 82 were women and 57 men. I did my survey personally during my one year stay in New Caledonia in 2012. In the survey, interviewees were asked one question: Are you for the complete independence of New Caledonia? Respondents were divided by gender, age, nationality and education. The survey included only people who want to participate in the elections next year. Survey shows great diversity of opinion across the company. The results in some categories may be distorted by the low number of respondents. Sufficient number of respondents lacking in the men's category over 60 years, which is mainly Kanak men refused to participate in the questionnaire. Low number of people with higher education is due to poor access to education for all citizens.

Research question: **Do you support the complete independence of New Caledonia?**

**Type of survey:** Questionnaire

**Sample size:** 139 respondents: 82 women and 57 men

**Table 11: The survey results of the referendum on the independence of New Caledonia in 2012 (age, nationality, education)**

AGE	WOMEN	MEN
to 30	38 (yes – 16, no - 22) NO 57.9%	30 (yes – 17, no - 13) YES 56.7%
25 - 55	27 (yes – 10, no - 17) NO 63%	22 (yes – 11, no - 11) X
from 55	17 (yes – 7, no - 10) NO 58.8%	5 (yes - 2, no - 3) NO 60%

NATIONALITY	WOMEN	MEN
Kanak	24 (yes –16, no - 8) YES 66.7%	24 (yes – 19, no - 5) YES 79.2%
Frenchman	35 (yes – 7, no - 28) NO 80%	18 (yes – 5, no - 13) NO 72.2%
Other	22 (yes – 10, no - 12) NO 54.5%	15 (yes – 6, no - 9) NO 60%

EDUCATION	WOMEN	MEN
Basic	31 (yes - 19, no - 12) YES 61.3%	29 (yes- 19 no - 10) YES 65.5%
Secondary	40 (yes – 12, no - 28) NO 70%	31 (yes – 9 no - 22) NO 71%
University	11 (yes - 2, no - 9) NO 81.9%	7 (yes – 2 no - 5) NO 71.4%

(author's own research)

**MEN: YES - 30 = 52.6%**

**WOMEN: NO - 49 = 59.8%**

**Total: NO - 76 = 54.7%**

Women are divided into categories according to age in all cases rather they tend to remain within the French overseas area. On the contrary, there is a large discrepancy between Kanak women, of whom the whole 2/3 voted for independence, and French, which would be against the Caledonian independence vote even to 4/5. Women of other nationalities would also be more inclined to stay. There are also significant disagreement among women divided by the highest educational attainment. Over 61% of women with basic education for the independence of New Caledonia, as opposed to just 70% of women with secondary and almost 82% of university graduates would vote against.

Men in their opinions also differ vastly. Nearly 57% of men under 30 years would vote for independence, 2/3 of men over age 60 would then be voted vice versa. As regards the breakdown by nationality, it would be nearly 80% of Kanak men for independence against the French was 72%, which would be joined by 60% of other nationalities. Distribution by educational attainment of men again brings big differences. While both would vote 71% of secondary school as well as university-educated men to remain under France, nearly 66% of men with basic shared the opposite view.

Differences of opinion between men and women also differ. Men are in fact far more inclined than women to independence. I see no reason that women more than men are afraid of change and fear of new and unknown things that the new political order brought about. Another reason may be fear of losing their social security and others that are able to provide them French.

Although the Kanaks, women and men, generally for independence, the result can support almost 4/5 of men, but only 2/3 of women. The paradox, however, the fact remains that, contrary to the independence of New Caledonia would vote more French women (80%) than men (72%). Altogether, 52.6% of men supported the creation of a new independent state of New Caledonia, while 59.8% of women would vote against. In the overall outcome of the elections would be 54.7% of the citizens of New Caledonia in favor of its retention within the French Republic.

In 2016, I have repeated the survey to see the differences between years 2012 and 2016. The research question stayed the same. I added one more information the province, where the respondent is resident.

Research question: **Do you support the complete independence of New Caledonia?**

**Type of survey:** Questionnaire

**Sample size:** 107 respondents: 61 women and 46 men

**Table 12: The survey results of the referendum on the independence of New Caledonia in 2016 (age, nationality, education, province)**

AGE	WOMEN	MEN
to 30	29 (yes – 16, no - 13) YES 55.2%	22 (yes – 15, no - 7) YES 68.2%
25 - 55	20 (yes - 8, no – 12) NO 60%	18 (yes – 10, no - 8) YES 55.6%
from 55	12 (yes – 3, no - 9) NO 75%	6 (yes – 3, no - 3) X

NATIONALITY	WOMEN	MEN
Kanak	23 (yes – 15, no - 8) YES 65.2%	21 (yes- 16, no - 5) YES 76.2%
Frenchman	28 (yes – 6, no - 22) NO 78.6%	16 (yes – 6, no - 10) NO 62.5%
Other	10 (yes – 6, no - 4) YES 60%	9 (yes – 6, no -3) YES 66.6%

EDUCATION	WOMEN	MEN
Basic	20 (yes - 11, no - 9) YES 55%	15 (yes - 9, no - 6) YES 60%
Secondary	33 (yes - 13, no - 20) NO 60.6%	27 (yes - 19, no - 8) YES 70.4%
University	8 (yes - 3, no - 5) NO 62.5%	4 (yes - 0 no - 4) NO 100%

PROVINCE	WOMEN	MEN
South	41 (yes - 9, no - 32) NO 78%	32 (yes - 15, no - 17) NO 53.1%
North	15 (yes - 13, no - 2) YES 86.7%	10 (yes - 10, no - 0) YES 100%
Loyauté	5 (yes - 5, no - 0) YES 100%	4 (yes - 3, no - 1) YES 75%

(author's own research)

**MEN: YES - 28 = 60.9%**

**WOMEN: NO - 34 = 55.7%**

**Total: YES - 76 = 51.4%**

We can see interesting differences between both surveys. In 2012 all woman age groups were against independence. In 2016 the youngest group of women is for independence. In 2012 was the youngest group of men for and oldest against independence, the medium group was undetermined. In 2016 are two younger groups for independence and only group of men older than 55 years was undetermined. We can see a progress in thinking of people, who are not so afraid of changes like before.

Statistics concerning nationality showing us also interesting facts. Nothing has changed in thinking of Kanaks and Frenchmen. Kanaks are strongly for and Frenchmen against independence. However the other nationalities as Vanuatuans, Tahitians or people from Wallis and Futuna are now rather for independence. It's a change in comparison with the year 2012, when the situation was opposite.

The situation has not changed a lot in classification by highest finished education. People with basic schools are voting for and people with university degree against independence. We can see a connection link with classification by nationality, because the most of the Frenchmen are mainly living in Grand Nouméa, where is a very good access to institutions of education. Kanaks are often living in isolated tribes, so their access for higher



education is limited. However also here we can observe some progress. I will mention a group of men with secondary education: in 2012 were more than 72% against, in 2016 more than 70% are voting for the independence.

The new last classification is divided by province of residents. This is bringing the most unambiguous results. Habitants of Southern province are voting against the independence, but habitants from Northern province and Loyalty islands are almost conclusively against. The gap is not so big on the first look, because much more people live in Southern province and a rest of the country is not strongly populated. The density is pretty low.

In general more than 60.9% of men are for independence, it's an increase by 8.3% in comparison with year 2012. Women are still against the independence, but the result is not so strong like in 2012, there is a decline by 4.1% from 59.8% to 55.7%. In my research were participating 61 women and 46 men, the common outcome show us that 51.4% inhabitants of New Caledonia are for the independence. This is big change of thinking across the population, because in 2012 would won followers of remaining within the French overseas territories.

## 5. Results and Discussion

The referendum of the independence of New Caledonia took place on 4<sup>th</sup> November 2018. Author is going to analyse the results and consequences of the referendum and also the results with his two own electoral surveys in this chapter.

The New Caledonian electorates were asked a question: Do you want New Caledonia to attain full sovereignty and become independent? The referendum ended with 43.33% for “yes” and 56.67% for “no”. Even though a result was clear, the differences in three provinces are enormous, how you can see in the table below.

Provided the result ends as “yes”, the independence would result in a transfer of sovereign powers as security, public order, currency, justice and also the access to an international status of full responsibility. The new organization of public authorities would not be effective directly after the referendum. There would be a transitional period, during which the transfer of powers would gradually take place.

Inasmuch as the referendum finally ended with option “no”, New Caledonia will remain a French community: the population will retain French citizenship and European citizenship. French state will continue to exercise sovereign powers. The provincial elections to renew the Congress of New Caledonia will be maintained and will be held in May 2019. At the end of these elections, if a third of the members of the Congress so request, a second referendum on the same issue will be organized within eighteen months of this request. In the case of a new vote of “no”, it may be followed by a third referendum.

**Table 13: The results of the referendum on the independence of New Caledonia in 2018**  
**- Do you want New Caledonia to attain full sovereignty and become independent?**

	No. of voters	Participation	YES	NO
New Caledonia	174,165	141,099 (81.01%)	60,199 (43.33%)	78,734 (56.67%)
Province of the Islands	21,406	13,095 (61.17%)	10,631 (82.18%)	2,305 (17.82%)
Northern Province	40,048	34,445 (86.01%)	25,747 (75.83%)	8,208 (23.99%)
Southern Province	112,711	93,559 (83.01%)	23,821 (25.88%)	68,221 (74.12%)

Source: Nouvelle-caledonie.gouv, 2018 (author's own processing)

The result of this election nonetheless highlights the deep political and sociological divides that fracture New Caledonian society. The “no” collects 74.12% in the Southern Province, where most of the population with very marked inequalities and wealth are concentrated.

It is necessary to withdraw the results from the biggest communes and a capital Nouméa, which are together called Great Nouméa. The “no” reaches 80.5% in Nouméa, what is represented by 32,290 votes, 74.4% in MontDore (10,559 votes), 78.2% in Dumbéa (10,536 votes) and 74.1% in Paita (6951 votes). This victory in four the most populated communes is crucial for a whole result of the referendum, it is 60,336 votes, which represents 76.6% of all votes for “no”. On the other side the biggest victory of “yes” was 5147 votes (80%) on an island of Lifou. (Nouvelle-caledonie.gouv, 2018)

On the other hand, “yes” is largely represented in the North Province (75.8%) and Loyalty Islands province (82.2%). Nevertheless, in these islands, the lower participation (58.9%) shows that part of the Melanesian population, although claiming independence, did not necessarily vote for the independence.

Especially young people wanted to express a strong sense of identity and a pride of their community belonging on the occasion of this election. Anyway the result is not related

to a progression for a breakthrough of their ideas to the supporters of independence electorate. It should be noted the failure of the call to take part on the independence side, because the participation should be even larger, especially on Loyalty Islands, where is still a huge potential for “yes” votes.

There was a big fear of separatists of a strong abstention during the referendum, on the contrary there was a strong mobilization of the Kanak communes supporting the independence, what narrowed the gap. The gap was estimated much bigger than a real result of the referendum actually was. This is a community vote among the Kanak and opposite there are all non Kanak, that is to say the New Caledonians of European, Asian, Wallisian or Tahitian origin.

These differences, which are still marked between the provinces, create a kind of glass ceiling of the independence vote according to the districts in Great Nouméa. The unitary campaign, led by the two independents components represented in the Congress (FLNKS-Union Calédonienne and National Union for Independence), managed to mobilize a part of their electorates, who have decided to go to urns and vote “yes” at the last minute. (Le Monde, 2018)

In the list of all electorates was around 46% of Kanaks. We can see from the results that the indigenous people of New Caledonia voted almost entirely for the independence. All election surveys predicted a clear defeat of the separatists, a range of surveys was from 25% to 37%. (SudOuest, 2018)

The opponents of the independence had campaigned on the theme of a massive non-independence. They were betting on an unambiguous victory get around 70% of the vote, which would convince the separatists from an endeavour of the organization of a second and third referendum of self-determination provided by the Nouméa agreement and also to convince the State to support them in this process. It is clear that the result of 43.33% for the independence has a significant impact on a future involvement of the country. It will motivate the supporters of independence to restart new debates about another referendum, which can be organized by 2022.

## **5.1 Comparison of referendum results with survey results**

Two surveys made by author have different total results. First survey (from 2012) finished with a result of “no” by 54.7% and the second survey ended with a result of “yes” by 51.4%. From these data we see that the first survey was more similar to the referendum result of “no” by 56.67%.

The interesting is a similarity between second survey and the referendum result from the point of view of individual provinces. A percentage of “yes” is very significant in Northern Province (75.8%) and also on Loyalty Islands (82.2%) and contrary the percentage of “no” is also huge in Southern Province (74.1%). The survey result of “yes” is 92% in Northern Province, 88% on Loyalty Islands and 67.1% of “no” in Southern Province (men and women together). We cannot compare, how individual electorates voted, because of the anonymity of all electorates. And also we cannot divided them by age, education or nationality.

## **5.2 Future perspectives of a new referendum**

Prime Minister Edouard Philippe will gather in Paris a committee of the signatories of the Nouméa agreement to draw collectively the conclusions of the referendum in December. Provincial elections will be held in New Caledonia five months later in May 2019. The elections will renew the elected representatives of the three provinces (South, North & Loyalty Islands) as well as those of the Congress, which elects the government. There is little chance that discussions about the institutional future will progress by these elections. At present, separatists have 25 out of 54 elected representatives in the Congress. (SudOuest, 2018)

It is necessary, according to the Nouméa agreement signed, to bring together a third of the elected representatives of the Congress to request the organization of a second or third referendum. The leaders of FLNKS repeat that they intend to go to the end of the process of decolonization of the agreement. The possible new referendum of independence could take place by 2022.

The main result of the referendum is a victory for the democratic mobilization, which gives a legitimized anchorage by the New Caledonian ballot box to France and opens

a new phase of dialogue to answer the aspirations that would strongly expressed in favour of the Kanak identity.

### **5.3 Evolution of nickel price after the referendum**

The results of the referendum have also a significant impact on the price of nickel. There was a decline of shares of 4.10% to 80.70 euros of Eramet group on the stock market, just one day after the referendum in the country. (Reuters, 2018)

The price of the nickel decreased, because the victory of the "no" on the accession of New Caledonia to full sovereignty leads some investors to take some of their profits on this metal. The result of the referendum puts an end to the relative uncertainty that was hanging over nickel. There is a need of a consideration of the consequences of the other institutional option.

A victory of "yes" could have obscured the visibility on the production and export of metal in New Caledonia. In other words, there would be a need of a change in the strategy for the sector faced with such a major policy shift in the country. The market could tense up the time to gauge the impact of the reforms. The disturbances around the incumbent, the company Le Nickel could also have a crushing impact on the market. Tensions were feared a drop in production in case of victory of the "yes", which would probably have pulled nickel prices up.

The nickel price at the London Metal Exchange raised to 11,810 \$ per tonne on 6<sup>th</sup> November surprisingly its value was set at 11,335 \$ on 8th November. This fall surprised the operators immersed in a hazy environment. Various factors intervene in this decline. One of these factors is the trade war initiated by the President of the United States, Donald Trump, against China. Another factor is the abundance of metal on the market, despite there is still a sustained demand. (Inc.nc, 2018)

## 6. Conclusion

The author determined the aim of this Diploma thesis to identify possible further political and economical development of New Caledonia, which is still part of the French overseas territories. The first part of hypothesis, that New Caledonia will remain a part of the French overseas territories after the referendum, has been proved partially. The majority of surveyed people (54.7%) voted against the independence of New Caledonia in a first survey in 2012. Even though there is change in comparison with the second survey, which predicted that the majority of the inhabitants of New Caledonia voted for the independence (51.4%) in 2016. Nowadays we know that 56.67% of electorates voted against the independence.

The second part of hypothesis, that the retention of kaledonia within the overseas territories of France will result in a decrease in the price of nickel on world markets, was proved by regression analysis. Regression analysis showed from the equation that a price of nickel decreases by 266 \$, when we are after the referendum.

When New Caledonian inhabitants decided to stay as a part of French overseas territories, it would be probably followed by further transfer of powers to New Caledonian authorities. There will be the reallocation of powers between France and New Caledonia, but this also seems to be problematic. France holds some significant powers, such as defense, public security or foreign policy.

The answer to the research question that may happen in New Caledonia totally independent country, is yes. The author believes that although New Caledonia has already done so for the past twenty five years, a major shift towards its independence, will go a long way to become a sovereign country. It is necessary to educate their own political elite that represented New Caledonia both at home and abroad. New Caledonia has political representatives in domestic institutions, institutions in France or in the European Parliament. Even though there is still a lack of qualified political elites, therefore New Caledonia is not ready for independence yet. It remains a fact, if New Caledonia is not ready now for the independence, won't be ready anytime. In the past, once the referendum about the independence of the country was settled, at that time, despite the escalation of the situation, the majority of the population voted against independence.

Remaining within the French overseas territories also brings positive aspects. The main benefits are public security and national defense. In this case France is a guarantor of protection Caledonian territory. Another positive aspect is a protection of social security Kanak population and positive discrimination on the labor guaranteed by France. Kanaks are preferred over other nations on the labor market. They have also a precedence over the Frenchmen.

On the other hand there is a shortage of skilled labor in fields with high qualifications in New Caledonia, and therefore it is necessary to call in experts from France and other foreign countries. University of New Caledonia offers only a limited number of fields of study. Moreover, most of the fields are only for bachelor's degree and master's degree is necessary to be studied abroad. The University doesn't offer studies in essential fields as medicine, it requires the arrival of foreign professional staff.

The main drawbacks of the current political regime is the use of mineral wealth of New Caledonia by France. Until 2012, before the opening of two new factories for the extraction of nickel Koniambo and Goro Nickel, almost all extracted nickel was transferred directly to France or other foreign countries. New Caledonia was losing its mineral wealth without any corresponding profit.

During writing of this Diploma thesis author faced a number of problems, the main one was the availability of references, especially almost any monographs about this topic haven't been accessible. The majority of sources was in French. Absolutely the most difficult was to find a literary sources, the author had obtained only twelve books directly from the archives and libraries in New Caledonia or from libraries in France.

New Caledonia is in many aspects very unique country, it is therefore only on citizens of New Caledonia, what will be the future direction of the country. Let's hope that New Caledonia will remain prosperous country in all key areas.



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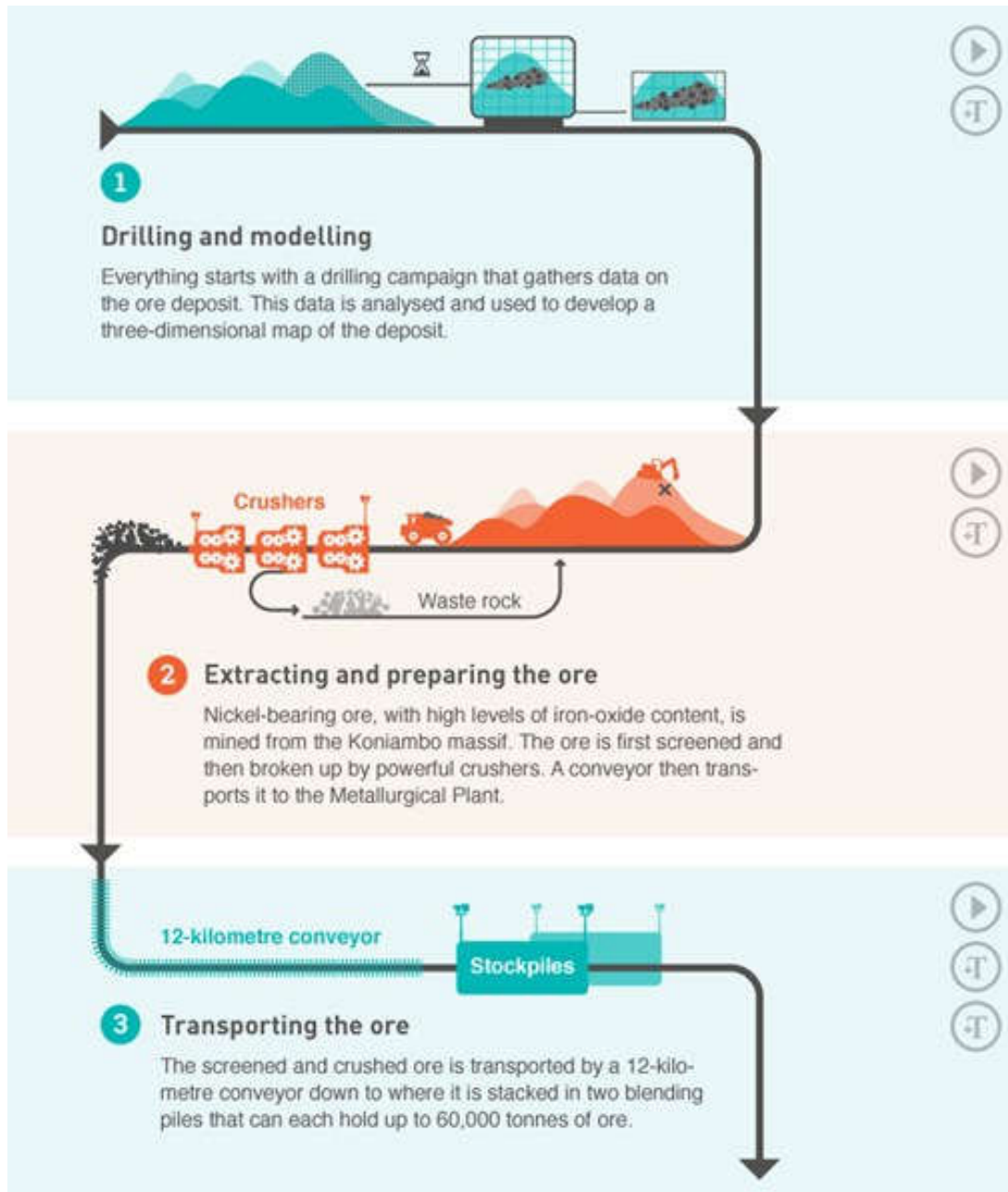
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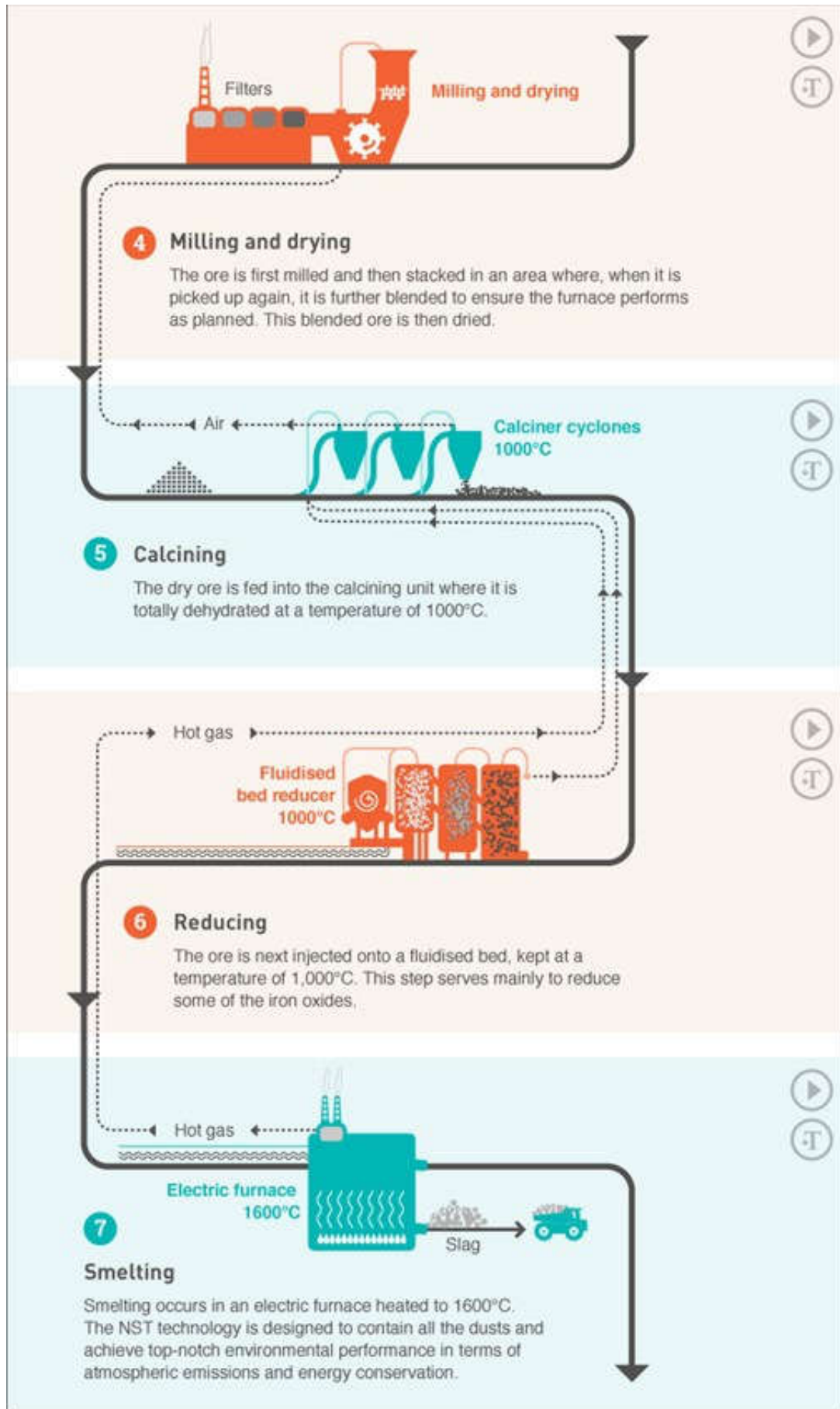
## 8. Appendix



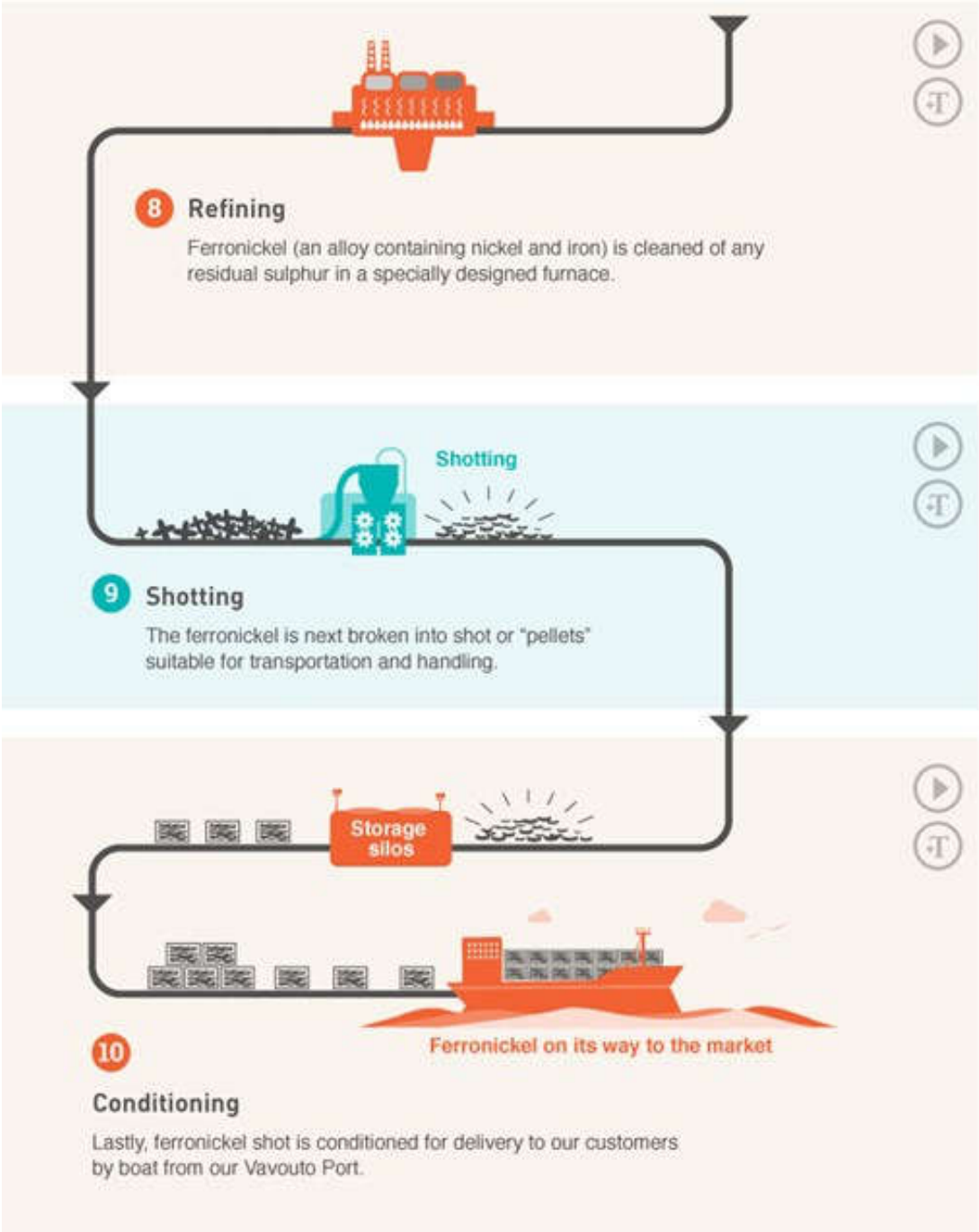
### Koniambo Nickel's Nickel Smelting Technology (NST)

Koniambo Nickel uses the NST process at its Metallurgical Plant. The stages in this process are milling and drying, calcining, reducing and smelting.

Start of NST process



End of NST process



Source: <http://www.koniambonickel.nc/article/notre-expertise/?ln=En>