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MASTER'S THESIS

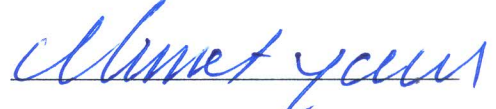**PUBLIC PRIVATE PARTNERSHIP AND PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING**

SELEN İDE

JUNE 2019

Tez Başlığı: **Kamu Özel Ortaklığı Modeli ve Kamu Özel Ortaklığı Proje Finansman Modeli**

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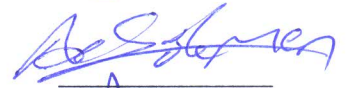Bu tez, tarafımdan incelenmiş olup yüksek lisans tezi olarak uygun bulunmuştur.
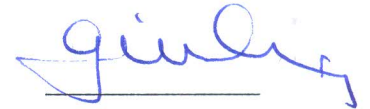
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ÖZET

KAMU ÖZEL ORTAKLIĞI MODELİ VE KAMU ÖZEL ORTAKLIĞI PROJE FİNANSMAN MODELİ

SELEN İDE
Yüksek Lisans Tezi

Sosyal Bilimler Enstitüsü
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Tez Yöneticisi: Doç. Dr. Aytaç GÖKMEN
Haziran 2019, 122 sayfa

Hükümetler, sağlık, ulaşım, kentsel gelişim gibi çeşitli endüstri alanlarında altyapı proje yatırımlarında fon sıkıntısı çekmektedir. Yakın bir zamana kadar hükümetlerin üzerinden finansman yükünün kaldırılması amacıyla "özelleştirme" bir çözüm olarak ortaya çıkmıştı. Benzer şekilde EPCF (Mühendislik-Temin-İnşaat-Finans) modeli de, büyük çaplı altyapı yatırımlarının fonlanmasında ciddi katkı sağlamıştır. Ancak bunların hiçbirisi, hazinedeki borç yükünün azaltılması veya kaynak kaybının önüne geçilmesi için yeterli olamamıştır.

Son derece esnek bir yapıya sahip kamu ve özel sektörün kuvvetli yanlarını birleştiren Kamu Özel Ortaklığı tam da arzu edilen amaca hizmet eder bir biçimde geçtiğimiz son yıllarda hayata geçmiştir. 1980 sonrasında İngiltere'de başlayıp sonrasında tüm dünyaya yayılan ve son zamanlarda Türkiye'de de şehir hastaneleri, havaalanı, altyapı ve köprü projelerinde de kullanılan Kamu Özel Ortaklığı, kamu hizmetlerinin sunumunda kamu ile özel sektör arasında yapılan, uzun dönemli yatırım projelerinde özel sektörün büyük finansal riskleri üstlendiği, kamunun ise hizmet sunumunu gerçekleştirdiği bir anlaşma türüdür. Tanımından da anlaşılacağı üzere KÖO'nın en belirgin özelliği kamu tarafından halka sunulacak olan ve yüksek bütçe gerektiren geniş çaplı sosyal ve ekonomik projelerin riskleri ve finansmanı özel sektörün sorumluluğundadır.

Kamu Özel Ortaklığı kendi içerisinde birçok alt model bulundurmaktadır. Yap-İşlet-Devret, Yap-Kirala, Tasarla-Yap-Finanse Et-İşlet, Yap-Sahip Ol-İşlet modelleri buna örnek olarak verilebilir. Bunun yanı sıra, tarafların arasında sorumlulukların paylaşılması ve fayda-maliyet ilişkisinde Kamu Özel Ortaklığında tek sınırlayıcı etken tarafların yaratıcılığıdır.

KÖO ile hayata geçirilen projeler hem kamu hem de özel sektör açısından birçok avantaj sağlamaktadır. Bu avantajlardan en önemlisi; özel sektörün bütçe esnekliğinden, yönetim becerilerinden, dinamizminden, yaratıcılığından ve teknolojisinden faydalanılması ile kamunun halka daha kaliteli, hızlı ve donanımlı bir hizmet sunabilmesidir. Ayrıca, toplumun refahı düşünülerek yapılan hizmetler sonucunda ekonomik büyüme sağlanmaktadır. Özel sektör ise kamu ile ortak bir amaca hizmet ederek kârını maksimize edebilmekte ve hem ülke içinde hem de ülke dışında ekonomik yönden ve ismen kendisini kanıtlayabilecek şansa sahip olmaktadır.

Kamu Özel Ortaklığı Proje Finansman Modeli projenin hayata geçirilmesi aşamasında mali yeterlilik, bütçe, kredi, projeden ve özsermayeden elde edilecek nakit akışı, bilanço ile teknik veriler ve varsayımlara dayanarak projenin fizibilitesini ve yatırımın kârlılık oranını sayısal veriler ile değerlendirmeye yarayan bir kaynaktır. Proje finansman modelinde beklenti, yatırımın borç karşılama kapasitesi ve iç verimlilik oranının bankalar tarafından verilen sınır değerden yüksek olmasıdır. Böyle bir durumda bu projenin verimli bir yatırım olduğu söylenebilir.

Bu çalışmanın amacı, Kamu Özel Ortaklığı'nın ne olduğunu, hangi alanlarda kullanıldığını açıklamak ve hem kamu hem de özel sektör açısından Kamu Özel Ortaklığı'nın kârlılık analizini Yap-İşlet-Devret modeli ile bir nikel madeni işletmesine uyarlanan kamu özel ortaklığı proje finansman modeli metadolojisiyle göstermektir. Çalışmanın üçüncü bölümündeki tablolarda yapılan hesaplamalar Excel uygulaması üzerinden gerekli formüller ve iterasyonlar uygulanarak hesaplanmıştır.

Bu çalışmada, Kamu Özel Ortaklığı kavramının daha iyi anlaşılabilmesi için uygulamaya dair ayrıntılı bir bakış açısına yer verilmiş ve hem kamuya hem de özel sektöre faydalı olabilmesi için Kamu Özel Ortaklığı Modeli kavramı sunulmuştur.

Anahtar Kelimeler: Kamu Özel Ortaklığı, Kamu Özel Ortaklığı Proje Finasman Modeli

ABSTRACT

PUBLIC PRIVATE PARTNERSHIP AND PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING

Master's Thesis
SELEN İDE

Graduate School of Social Sciences
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Thesis Advisor: Assoc. Prof. Dr. Aytaç GÖKMEN
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It has been quite a long time that the governments have suffered from shortage of funds in the attempts of investing infrastructure projects in different industries including health, transportation, urban development, and water supply.

Until very recently privatization emerged as a solution in respect of relieves from financial burdens of government. Similarly, Engineering Procurement Construction Financing (EPCF) model contributed a great deal of support to funding large scale infrastructure projects. However, all these models were not sufficient to save the governments either to undertake debts on their treasury or to face huge amounts of recourse losses.

Public Private Partnership which is extraordinarily flexible, very versatile and enforcing the strong sides of private sector and public authority, has been carried into effect over the past few decades. PPP used in the recent years in Turkey for realization of city hospitals, airports, bridges and other infrastructure projects, emerged in 1980 in UK then spread over the world is a kind of partnership between the private and public sectors where private sector undertake financial risks and public sector undertake to supply public services in long term investment projects. As seen from the definition, the most distinctive factor of public private partnership is that the risks and funding of the large scale social and economic projects put in service by public sector and need high budget, are in the responsibility of private sector.

Public Private Partnership accommodates many sub-models in its entirity. Build-Operate-Transfer, Build-Lease, Design-Build-Finance-Operate, Build-

Own-Operate models can be given as examples. But, it should be noted that the only restriction in Public Private Partnership about how to share liabilities and how to establish benefit-cost relations, simply depends on the creativity of the sides.

The projects which are realized with PPP provide lots of advantages in terms of both public and private. The most important one of these advantages is that public sector produce services with better quality, well equipped and in a faster way due to the budget flexibility, management skills, dynamism, creativity and technology that the private sector provide to public. In addition, economic growth is achieved as a result of the services provided by the welfare of the society. On the other hand, private sector becomes able to maximize its profit as serving for a common purpose with the public and thus he gets the chance to prove himself at home and abroad by his name and well-being.

During the stage that the project comes into life, PPP Financial Modelling is a source for evaluation of the project in terms of feasibility and investment profitability depending upon the assessment of numerical data resulted from the studies of financial capacity, budget, credibility, cash flow (from project and equity), balance sheet and other technical data. In financial modelling, the expectation is that the depth coverage ratio and the internal rate of return of the investment should remain at the level above the banks would accept. In case that these criteria are fulfilled simultaneously, the investment can be entitled as "feasible" for both public and private sides.

The aim of this study is to explain what the Public Private Partnership is, in which areas it is used and demonstrate profit analysis of the PPP in terms of both public and private sector through the Build-Operate-Transfer model and the methodology of public private partnership project financing model adapted to the nickel mine operation.

In this thesis, a thorough understanding of Public Private Partnership concept is given taking into consideration of all application aspects and cases faced in application in order to achieve a study to contribute to those who are indulged in Public Private Partnership by some reasons.

Key Words: Public Private Partnership, Public Private Partnership Project Finance Modelling

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I would like to thank to my mother Zerrin İde and my dear brother Tayfun İde for their continuous support, encouragement, appreciation and love throughout my entire life. Especially, I owe my heartiest thanks to my dear father Turgay İde helped me so much throughout this work, always being with me, sharing his never ending useful advices. I thank him with all my heart, this thesis could not have been accomplished without his support.

Finally, I need to thank my dear friends and colleagues for their constant support in daily struggles and especially my deepest thanks to Berkay Onay for being there anytime I need his encouraging words that certainly lifted my morale whenever I required most.

I dedicate this study to students, public and private sector staff who are interested in Public Private Partnership or Public Private Partnership Project Finance Modelling. I wish that information related to PPP and the application of PPP project finance modelling will be a guide for those. I also hope that Public Private Partnership which is widely applied in the world will be implemented more and more in Turkey and useful services will be offered to the society.

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ABBREVIATION LIST

BLT : Build-Lease-Transfer

BO : Build-Operate

BOO : Build-Own-Operate

BOOT : Build-Own-Operate-Transfer

BOT : Build-Operate-Transfer

CAPEX : Capital Expenditure

DBFO : Design-Build-Finance-Operate

DCMF : Design-Construct-Manage-Finance

DCR : Debt Coverage Ratio

DF : Discount Factor

DSRA : Debt Service Ratio Account

DSCR : Debt Service Coverage Ratio

EBT : Earning Before Tax

EBIT : Earning Before Interest and Tax

EBITDA : Earning Before Interest, Tax, Depreciation and Amortization

EPC : Engineering Procurement and Construction

EPCF : Engineering, Procurement, Construction and Financing

EU : European Union

IDC : Interest During Construction

IMF : International Monetary Fund

IRR : Internal Rate of Return

LLCR : Loan Life Coverage Ratio

LTPA : Long Term Partnership Agreement

MNR : Ministry of Natural Resources

NPV : Net Present Value

NTP : Notice to Proceed

O&M : Operation and Maintenance

OPEX : Operational Expenses

PFI	**:**	Private Finance Initiative
PFP	**:**	Privately Financed Project
PLCR	**:**	Project Life Coverage Ratio
PP&E	**:**	Plant, Property&Equipment
PPI	**:**	Private Participation Infrastructure
PPP	**:**	Public Private Partnership
RE	**:**	Retained Earnings
WACC	**:**	Weighted Average Cost of Capital
WB	**:**	World Bank

INTRODUCTION

In order to contribute to those who are involved in Public Private Partnership up to some extent, a thorough understanding is given in this study to Public Private Partnership concept with respect to fields of application and the bottlenecks encountered.

Within this study, papers, thesis and other publications published in Turkey and abroad related to project financing have been broadly studied and thus PPP model has been applied to a nickel mine owned by Ministry of Resources Kazakhstan who entered into PPP agreement with a British private company NickTOLL for 20 years of operation. At the end of the financial modelling calculations, it has been ascertained that the PPP under Build-Operate-Transfer model is a profitable partnership due to high internal rate of return(IRR) and debt service coverage ratio (DSCR).

In the first part of this study, information related to literal definitions, history, features, structure, types of public private partnership and reasons for the preference of public private partnership, differences between various public private partnership models, comparison of classical purchasing model and public private partnership models are given. In the second part, public private partnership project finance model is explained. And in the last part, project finance modelling related to the nickel mine mentioned above has been studied, and profitability of the private company under Build-Operate-Transfer model has been inspected.

It has been aimed to provide a better understanding of application in lieu of the theoretical knowledge compiled on PPP. On the other hand, evaluation of project feasibility and cash flow are explained with the support of numerical data on the basis of project finance modelling within the coverage of PPP Build-Operate-Transfer model. Thus, it has been aimed that this study would provide guidance to those public and private sector staff.

THE EVALUATION OF PUBLIC PRIVATE PARTNERSHIP IN THEORETICAL FRAMEWORK

In this section, the definitions, history, features, differences from similar concepts, scope, structure and preference reasons of Public Private Partnership are studied in order to provide better understanding to the PPP concept in theory and practice.

1. DEFINITION OF PUBLIC PRIVATE PARTNERSHIP

In countries which have low and middle income with rapid growth population, urbanization and efforts to develop economic and commercial activities bring the need of increased infrastructure investments. However, with limited budgets, in short time, it is difficult to meet the need only by sources of the public authority. As a result of this, Public Private Partnership model is established between the public authority and private sector.

Public Private Partnership is a financial investment and service model based on the principle that the public authority establishes a long-term (up to 49 years) contractual relationship with a private sector. Also, PPP can be defined as a long term agreement in which the purpose of public service delivery is consistent with the purpose of profit maximization of private sector partner. (OECD, 2011, p.3)

Public Private Partnership generally refers to realization of investment and services based on a contract through sharing of project cost, risks and returns between the private sector and public authority.

In spite of extensive use of literature published since early 1990s, it is not possible to make a single definition or to speak on single model of Public Private Partnership. The reason behind this is that, PPP is ultimately flexible, limited only by creativity of those involved and their access to funding.

Some definitions related to public private partnership are as follows:

Public Private Partnership is a long term contract for the procurement of public well-being or service between public authority and private sector, where the private sector undertakes significant risks, management responsiblity and payments associated with performance (World Bank, 2014, pp. 17-18).

In the Green Paper published by the European Union, Public Private Partnership is defined as a cooperation agreement between the public authority and business community in order to provide financing to construction, renewal and management of an infrastructure or service to be provided. (European Commission, 2004, p.3). After this definition EU Commission has emphasized the four basic determinant features of PPPs. It has been firstly mentioned that PPP is a long term partnership between a public and a private entity in different stages of a planned project. Secondly a project to be financed partly by private sector by means of complex arrangements between various actors. Thirdly the significant role (design, construction, operation and financing) of the economic actor taking in different stages of the project and finally, within the frame of distrubition of undertaking the risk, it has been pointed out that the major risk is undertaken by private partner.

According to Kerman et al.; PPP is a method which brings together the public and private sectors in the implementation of public service based on the principles of equality and co-management which adopts new public managament approach; cost, risk and benefit in the production of goods and services that are shared by all actors. (Kerman et al., 2012, p.4)

Directorate of Privatization concluded that, while applications for the realized investments are evaluated within the scope of privatization, Public Private Partnership model is the privatizatiın of future investments. (Acartürk & Keskin, 2012, p. 42)

Eker, defines the PPP as an arrangement in which the authority and responsibilities, cost and risks, income and benefits between public and private sectors are shared at optimum rates. (Eker, 2007, p.59).

The United Nations defines PPP is not as a privatization, but defines as a structure that includes regional-based organizations, long term consession agreements with private sector and informal dialogues between policy makers. (Akintoye et al., 2003, pp. 4-5)

Moreover, PPP can be defined as design, financing, construction and management of necessary infrastructure and plant in order to provide services or integrated, enlarged legal or institutional form of the methods of private sector participation in renewal, leasing, maintenance and repair of an existing public investment.

Linder defined the Public Private Partnership in 6 different ways according to its purposes. (Güler, 2016, pp.4-5)

PPP as a management reform: An innovative tool to create change in management function. Also, it is a kind of guide that provides information flow from business units to administration.

PPP as a problem transformation: A useful method to eliminate the commercial problems which arise in public service delivery.

PPP as a moral renewal: A structure which includes public administrations and the partnership.

PPP as a risk sharing: Is an agreement that the private and public partners are affected by financial burdens to a certain extent within the frames of the contracts signed.

PPP as a restructuring of public services: It is the rearrangement of administrative procedures to meet the demands through partnership.

PPP as a sharing of power: In partnership, control and power are distributed in different ways. For this reason, PPP offers different approaches to issues such as cooperation and confidence, information, responsibility and risk sharing and reconciliation.

Common point of the definitions is that there is a cooperation where the risk, benefit and cost are shared between the public and private sector.

The answers to the question "What is Not?" for the PPP model is important for a clear understanding of this method. Accordingly, PPP is not a simple outsourcing tool for services and functions, a donation made by private sector for the public good; renounce from state assets and obligations; commercialization of public functions through the generation of a state-owned enterprise, and public borrowings. (Altan et al., 2013, p.10)

Finally, Public Private Partnership is the general name given to a series of contractual relationships between public authotirity and private sector for the realization of investment projects.

2. HISTORY OF PUBLIC PRIVATE PARTNERSHIP

2.1. Public Private Partnership Applications In The World

The first applications of PPP model in the world started in 17th century in Europe in realization of infrastructure projects with concession rights in various sectors.

The first initiative applications of public private partnership (PPP) model started in the UK in 1660s with PFI-Private Finance Initiative (Green Paper, p.11), established in cooperation with private sector after abolition of legal regulations preventing the private sector to enter into public space (Boz, 2013, p.280). The main principle of PFI; as a result of the management and other benefits derived from the private sector, is to make possible to obtain the value of money on the basis of higher financing costs and to enable the risk to be transferred to the party who can best manage the risk in real terms. The PFI, its development was slow until the Labor Party came into power in 1997, started to reach its real speed as a result of the increasing production and efficiency efforts of party in public private sector. As a result of this effort, the PFI Treasury Working Group was established to speed up the development of PFIs and provide guidance. In 1998, PFI gave its place to PPP. Although, PPP and PFI are similar concepts, PFI remains as sub-model of PPP. (Keşli, 2012, p.42)

The PPP model which was initially used in UK for the construction of road projects, was later used in projects of transportation, environmental protection, education, health and general services. In the middle of the 19th century, lots of London bridges and at the end of the 19th century Brooklyn Bridge were built with the private capital (Yescombe, 2007, p.74). Especially, applications of public private partnership model in the canal and railway projects have reached to the highest level and following successful implementation of this model in the UK, many countries have begun to use this model within their own borders. Therefore, UK is the first in terms of both the total number of PPP projects and the highest number in value.

Some infrastructure services have been established and operated by the private sector in Europe in 19th century. In 20th century, PPP applications are used widely-

especially after the Second World War - in some countries (France, Italy, Japan and USA) in the construction of highway networks. Between the 1990-2009, two-thirds of the projects in Europe have been realized in the UK with PPP model. (Sözer, 2013, p.216)

The term "Public - Private Partnership" has been first used, in 1950s in the USA to provide finance by the public and private sectors to educational and similar programs. However, wide use of the term "public private partnership", can be seen in the search of a preferred term for public and private sector co-financing needed for renewal of urban infrastructure in 1960s. This term, spreading from America to the world, was used to express the public support in the private sector technology and research activities as well as publicly funded social services provided by voluntary organizations. In this respect, the term PPP is used internationally in fighting with diseases such as AIDS and malaria by developing new methods in medicine and agriculture. (Smith, 2000, pp.2-3)

Moreover, in 17th century, in France, constructions of canals were realized with PPP model using private sector capital.

In recent years, PPP play an important role in realization of infrastructure investments both in developed and developing countries.

According to World Bank statistics, the contract amount of PPP projects, including privatizations in developing countries, increased gradually during 1990s and reached to its highest level in 1997 ($107 billion). Total number of PPP projects realized in EU within the recent 22 years, (1990-2011) reached to 1536, as annual average being 70. Total project magnitude being Euro 290 bil., has annual project value of Euro 189 mil. (Ministry of Development, 2012, pp. 8-11).

Some PPP infrastructure examples in Europe are as follows: (Lewis&Grimsey, 2004, p.3)

The Sofia Water and Wastewater Concession Project is the major municipal infrastructure concession in Bulgaria and one of the first water concession to be

financed on a limited recourse basis in Eastern Europe via a special purpose vehicle. This project duration was 15 years and reached to financial close in October 2000.

The Helsinki-Labri Motorway is the first and largest PPP in Finland. It begun in 1997 and its equity was provided from UK, Sweden and local entity.

Germany has no formal PPP programme, but in the past, road projects (ex. Warnow Tunnel) were realized with PPP that involved private contractors.

Table 1 : Usage Areas of Public Private Partnership Models in Some Countries

Country	Usage Areas
Finland	Transportation, School and University Construction
France	Water and Wastewater Treatment Plant
Greek	Road Construction and Train Transportation
Ireland	Transportation, Education and Wastewater Treatment Plant
Italy	Hospital, Transportation and Wastewater Treatment Plant
Portuguese	Airport and Road Construction
Spain	Motorway and Wastewater Treatment Plant
South Africa	Jail, Water and Wastewater Treatment Plant, Construction of Hospital and School

Resource: Teker, 2008, p.7

Although public private partnership is a new term, it is an old method to realize public facilities with private sector.

Alternative PPP names are used in different countries with different meanings. (Yescombe, 2007, p.4) These are;

- South Korea Private Participation Infrastructure Programme and the Private Participation in Infrastructure (PPI) terms derived by the World Bank are used for the Financing to Developing Countries.
- The term Private Sector-Participation (PSP) used in development banking sector.
- Privately-Financed Projects (PFP) is used in Australia.

- The Private-Finance Initiative (PFI) of which first occurrence is in the UK, but recently used in Malaysia and Japan.

2.2. Public Private Partnership Applications In Turkey

The fundamentals of PPP model date back to the Ottoman Empire in 1850s. The first investment of PPP started with concesssions granted from Ottoman Empire to British entrepreneurs for İzmir-Aydın railway construction in 1856. In accordance with these concession agreements, British entrepreneurs signed a contract to obtain a profit guarantee of %6 of the capital for a period of 50 years. In case of the profit falls below this rate, the rest of profit amount was sovereign guaranteed by the Ottoman Empire treasury. (Kurmuş, 1972, p.38) And also, British possessed the operation rights of mines that are 25 km away from rails with railway concession agreement. As a result of this concession agreement signed with the Brits, the Ottoman Empire proved its power in short term. However, in medium and long term, PPP investments made parallel to external borrowing in an uncontrolled and unplanned manner adversely affected macroeconomic indicators. During this period, due to the weakening of its foreign debt capacity, in 1879, Ottoman Empire was obliged to leave its tax revenues that are obtained from stamps, alcoholic beverages, fishing, salt and tobacco to creditors for 10 years in return for domestic debts. Following this, in 1881, external creditors from European countries established "Ottoman Public Debt Administration" consisting of 5 countries (UK, Holland, France, Italy, Austria) and representing foreign creditors in İstanbul with a total of 7 members including one reprensentative for local creditors and Galata bankers. Thus, the duty of collecting taxes and assigning it to creditors and the control of Ottoman finance have been entirely covered in "Ottoman Public Debt Administration" (ATO, 2009, p.83). Moreover, investments were realized with the participation of French, German and British capitals within the frame of build-operate-transfer model in various areas such as infrastructure investments, operating of mines, railways, electrical, telephone, gas and tramway infrastructure. As well as incentives for the investments made within the frame of this model, advantages like income guarantee were given to creditors under the "mileage guarantee system" as in revenue sharing and railway investment. Consequently, Ottoman Empire have

completely fell under the hegemony and domination of western capital. (ATO, 2009, p.80)

In 1894, two thirds of foreign capital have been invested in project areas. During this period, the reason of foreign investors concentrating on railways is that it has been allowed by Ottoman Empire to the countries that provide capital to their national treasury to create cheap raw-materials and distribution networks for industrial products. Besides, foreign companies have been making their profit with the "mileage guarantee system". In accordance with this system, if the foreign countries made profit under the confirmed guaranteed profit, they were able to collect the difference from Bab-ı Ali. Consequently, the finance and economy of the country have been given to the control of foreigners with rail transport projects, mileage guarantee system, granting the right to operate of mines and unconditional opening of domestic markets to foreigners.

On post-republic economy strategies, the results of the PPP and external borrowing strategy, began in 1854, were effective until 1954 when the last installment of debts was paid.

After the 1980s, outsourcing has become an important financing method for Turkey's economy in terms of varying world and country needs.

The reasons why the private sector is oriented towards outsourcing are the policies implemented in the country, resource shortages, costs and the need for foreign currency.

In Turkey, PPP investments have been implemented in the fields of Build-Operate-Transfer, Build-Rent-Transfer, and Build-Operate-Own since 1986.

According to World Bank report, 3rd Airport Construction project ($35,587 billion), Gebze-Izmir Highway (including Osmangazi bridge- $6,356 billion) and Dalaman Airport projects ($1,086 billion) constitute the portion of %75 of total cost within the 10 largest projects of 2015 in Turkey (Alagöz & Yokuş, 2017, p.120). As it can be seen from the report, Turkey is planning to invest heavily in PPP projects in recent years.

Some examples of ongoging projects in Turkey can be given as North Marmara Highway (Kınalı-Odayeri Zone) $1.2 billion, North Marmara Highway (Kurtköy-Akyazı Zone) $2 billion, Kınalı, Tekirdağ, Çanakkale, Balıkesir Highway Malkara (Çanakkale Zones) $3 billlion, Menemen-Aliağa-Çandarlı Highway $468 million, Ankara-Niğde Hihgway $1.4 billion, Kocaeli Integrated Health Campus $396 million, Bursa Integrated Health Campus $399 million, Gaziantep Integrated Health Campus $932 million, İzmir Bayraklı Integrated Health Campus $614 million, Etlik Integrated Health Campus $1.2 billion, İkitelli Integrated Health Campus $1.6 billion, Sanlıurfa City Hospital $405 million, Konya Karatay Integrated Health Campus $269 million, Tekirdag State Hospital $252 million. (V. Aydın., 2019, DEİK PPP Committee & İstanbul PPPCOE)

Projects realized in 2018 are as follows Çeşme Alaçatı Airport $22 million, Ipsala Customs Station $ 26 million, Gürbulak Custom Station Transfer of Operational Rights $1 million, Tekirdağ Port Transfer of Operational Rights Approximately $66 million, Anamur, Bozyazı, Mut-Derinçay, Silifke, Zeyne Hydroelectric Plant Transfer of Operational Rights (5 Switchboard) $2.4 million, Sütçüler Hydroelectric Plant Transfer of Operational Rights $1.6 million, Gönen Hydroelectric Plant Transfer of Operational Rights $12.3 million. (V. Aydın, 2019, DEİK PPP Committee & İstanbul PPPCOE)

Finally, Physical Medicine Rehabilitation, Psychiatry and High Security of Forensic Psyciatry Hospitals, Konya Karatay Integrated Health Campus, Kocaeli Integrated Health Campus, Kütahya City Hospital, Tekirdag City Hospital, Gaziantep City Hospital, Izmir Bayraklı Integrated Hospital Campus, Istanbul (Ikitelli) Başaksehir Integrated Health Campus, North Marmara Highway Kurtköy-Akyazı Zone, North Marmara Highway Kınalı-Odayeri Zone projects are expected to be put into service in 2018. (V. Aydın., 2019, DEİK PPP Committee & İstanbul PPPCOE)

3. FEATURES OF PUBLIC PRIVATE PARTNERSHIP

The main purpose of developing countries is to take part within the developed countries. Condition for reaching to this goal depends on the realization of modern infrastructure investments without disturbing the internal and external economic balance. Inability to realize the public infrastructure investment projects needed for economic growth with limited budget opportunities causes popularization of using PPP model in developing countries (Alagöz&Yokuş, 2017, p.115). Due to this reason, PPP model has been developed in order to enable the participation of the state into the services that the state does not want to refrain completely and the private sector can not overcome without participation of the state, hence, to overcome the problem of the financing by the state.

Usually PPPs are formed by public, private sector or by non-profit third sector institutions and organizations coming together and taking one or more of the roles such as financing, presentation and supervision. In PPP projects, generally private enterprises are responsible for collection of service fees from the users meanwhile public authority share the risks of supply and demand with private sector. (Emek, 2009, p.8)

In addition, the public entity can provide guarantees on issues such as debt repayment, purchase and input; and it can pay the part or all of the cost to the private sector. While these collaborations are financed, private sector equity investments are used besides the external resources. Especially in projects that require large capital investments, funds can be provided from issuance of bonds or public offerings as well as the loans from banks or from state. (Değertekin, 2010, p.27)

Furthermore, PPP has potential to combine the strong side of public and private sector in order to overcome unfair distribution and market failures like externalities, inefficient decision making, inadequate organizational and institutional framework, lack of competition and lack of efficiency and so on. (Kwak et al, 2009, p.52)

Although there is not a single definition of public private partnership, the models in the spectrum have several common features.

- A long term contractual relationship between the public authority and private sector.

- Sharing of risks between the parties for the realization and management of investment projects.

- Experience of the private sector for the arrangement of necessary funding and execution of projects.

- Partnership of two or more actors. One side is public authority and the other is private sector.

- Each side has management position and they have rights to bargain on their behalf. In some cases, public authority can transfer the establishing partnership operation to a special agent.

- Materialized or non-materialized resources are transferred between the sides mutually.

- Partners share responsibility.

Also;

- Usually, partnerships apply in large-scale projects which require high financing, but it also enables the use of small-scale practices.

- Funding is provided by private sector.

- Partnership does not mean outsourcing. Usually, these are the projects combining the capital, design, construction and maintenance.

- Partnerships find their application area in infrastructure projects which constitute consessions and public services. Characteristics of goods and services that are the result of designs are determined by state. The main purpose of public sector in partnership is to provide task coordination and auditing, so public sector takes an efficient role throughout the project.

- PPP term is not used as a legal concept in literature, it is used as a "general title" which is the general name of all policies in the application. (Vergil et al., 2014, p. 213)

- Public private partnership models take place between the Classical Purchasing and Privatization. Therefore, it may also exist in the names and models that are listed below.

Table 2 : Procurement Models of Public Private Partnership

Classical Purchasing	PPP	Privatization
	PPP	
	Build-Operate-Transfer(BOT)	
	Build-Own-Operate-Transfer(BOOT)	
	Design-Build-Finance-Operate(DBFO)	
	Design-Construct-Manage-Finance(DCMF)	
	Independent Power Producer	
Classical Purchasing	Build-Own-Operate(BOO)	**Privatization**
	Private Financing	
	Partial Privatization	
	Joint Ventures	
	Business Contracts	
	Consession Agreements	

Resource: Delmon, J. (2017). Public-Private Partnership Projects in Infrastructure Cambridge University, p.9

In implementation of infrastructure projects, public private partnership model does not completely replace the classical purchasing and privatization contract.

4. DIFFERENCES BETWEEN VARIOUS PUBLIC PRIVATE PARTNERSHIP MODELS

In this part, differences between various public private partnership models will be explained. Privatization, consession agreement, joint-venture and build-operate-transfer models are covered under PPP, but they differ from each other with distinctive characteristics.

4.1. Public Private Partnership and Privatization

Public private partnership model has been developed as an alternative method to the concept of privatization due to negative points of privatization and restrictions on public debt. With the concept of Public Private Partnership, more positive approach to the concept of privatization has been established.

The role of public authority in privatization and public private partnership models is different from each other. In privatization the public authority takes the role of being economic shield, while it takes the role of being both the regulator and the supervisor in PPP. In the execution of public services by private entity, the supervising and auditing ability of the public authority is not only a controlling activity but it is the undertaking of final responsibility. (Uz, 2007, p.1168)

It has been expressed that the other differences between public private partnership and privatization can be expressed as follows. In privatization the existing public assets are transferred to private sector whereas in public private partnership model the future public assets are transferred to the private sector. (Kilci, 2006, p.3)

Public Private Partnership contract cannot be defined as a type of privatization. In case of privatization, ownership of subject public authority or business is transferred to private sector and private sector can freely determine the market conditions. However, in public private partnership applications service procurement is carried out according to the contractual procedure and competition continues between individual capitals. (Cebeci, 2011, p.99)

Also, the persons concerned with the provision of services may change after contract expiration and consequently public private partnership is separated from privatization in the absence of transfer of ownership.

4.2. Public Private Partnership and Consession Agreement

Concession Agreement is a kind of contract which aims the long term execution of public services within the framework of the contract signed with public entity by a special legal corporate body concessionaire who is at the status of an incorporated company, based on the condition that all kinds of expenses, capital, profit, loss and damages are born on to concessionaire. (Onar, 1966, pp.536-539)

According to the above definition, the concession agreement is considered as an administrative contract whereas public private partnership is accepted as a private law contract. In addition, in concession agreements, concessionaire provides financing at the end of the service from beneficiaries who have used these services, but in Public Private Partnership, financing is provided with the lease payments made by the public administration. Eventually, the facilities which have been operated in the process of public private partnership are transferred to the public sector at the end of the concession period without paying any price; in public concession, the facilities are transferred by means of purchase of facility to public entity at the end of the concession period. (Boz, 2013, pp. 296-297)

4.3. Public Private Partnership and Joint-Venture

Joint venture is a combination of two or more enterprises aiming for a common purpose. The main factor in joint venture is to maximize the profit between the parties.

Joint Venture takes place when the private and public sectors jointly finance, own and operate a facility. As examples there are urban regeneration schemes in the United States in which local government authorities purchase and clear blighted areas for private developers or themselves to invest in new construction, such as a new city hall or government offices as part of downtown redevelopments. (Grimsey, K.Lewis, 2004, p.11)

In public private partnership, while one side of cooperation is an enterprise, the other side is absolutely public entity.

4.4. Build-Operate-Transfer Model

Build-Operate-Transfer model is a special financing model developed to be adopted in projects that require advanced technology or high financial resources.

In this model, the investment cost is paid to the capital investing company or foreign company by the administration or service user who purchase the services or commodities produced during the operation period. In addition, private sector takes primary responsibility for funding, designing, building and operating of the project. Control and formal ownership of the project is then transferred back to the public sector. (Grimsey, K.Lewis, 2004, p.10)

The Build-Operate-Transfer (BOT) model is generally used in construction of bridges, roads and other public projects. As in public concession agreements financing is obtained from users.

5. COMPARISON OF CLASSICAL PURCHASING AND PUBLIC PRIVATE PARTNERSHIP MODEL

At the present time, classical purchasing and types of PPP models are still in use in various countries with different ratios in the supply of public services along with the privatization model.

Table 3 : Comparison of Classic Purchasing and Public Private Partnership Model

	Classic Purchasing	**PPP Model**
Description	-Making of desired manufacturing, material or service by public authority	-Both public authority and private sector undertake the design, construction and operation of a project
Features **Contract** **Successful Bidder**	-Single purpose -Short term projects -No direct connection with service management -Public service is not delegated	-Multiple purposes -Long term projects -Direct connection with service management -Public service is delegated
Basic **Characteristics**	-The work is controlled by public authority -The contractor is not obliged to fund the project -The contractor is not obliged to make capital investment	-The work is controlled by the Special Purpose Entity -The contractor is obliged to fund each phase of the project -The contractor is obliged for capital investment

Resource: Çekirge, H.Levent (June, 2006). *Public Private Partnership Applications in the World and Turkey and Case Study of Financial and General Advantages of the Model*. Master's Thesis.

6. SCOPE OF PUBLIC PRIVATE PARTNERSHIP

Main purpose of public authority is to meet the needs of society. It is not always so easy. Because it is deemed to have sufficient financial resources in order to provide needed public services. Therefore, various financial models are considered.

Financial deficits will occur if expenditures cannot be covered within the revenues collected from budget. Therefore, in order to eliminate financial deficits in the budget or to limit the existing deficits; financial models decreasing the public finance load are to be considered.

When project finance models are taken into account; the state's monopoly comes in mind first. Then, privatization process occurs. In the present time, public private partnership model has been developed against privatization and state's monopoly. Public Private Partnership is a model where the project can be shared by two or more sectors, and financial needs are fulfilled meanwhile private sector may have profit in terms of obtaining rental income through this partnership.

The biggest benefit for public sector is to provide the services supplied through the realization of projects requiring high cost and finance. Advantage of private sector is to obtain rental income within the determined contract period.

At the EU level, PPP term is determined as the provision of different types of agreements between public administrations and private sector about infrastructure investments and supply of services. So, there will be no action outside the sectoral objectives.

It is known that PPP exists in various forms depending on the qualification of projects, degree of participation of public and private sectors to projects, different allocation of risks between the partiess.

Since begining of 2005, solutions have been produced by State Planning Organisation from the projects being implemented that experience has been gained, and problems have been faced. So that new models have been developed to be applied by various solution alternatives.

As a result of these studies, demands have been evaluated and related law has been prepared including all models and sectors where PPP could be applied.

Moreover, draft text of the law was published on the State Planing Organisation website and views of relevant entities were requested.

In 2007, draft law in consideration was completed but it could have not been enforced as law. By the end of 2009, a new text comprising the name "Draft of the Law in concern to the realization of some investments and services within the framework of cooperation between public and private sectors'' has been announced. In spite of the fact that there has not been enactement of a public general law covering public private partnership, a PPP law which can be used in public health services, has been enacted by the Ministry of Health Covering Construction of Health Facilities and Supply of Services also Covering the Alterations in the Decrees, by the Law Nr. 6428 dd. 21.02.2013. (Güngör, 2012, p.103)

While the PPP model is initially considered as a way to provide financing needed to meet infrastructure requirements of country, it is accepted as the model where the public authority will benefit from the efficient management skills of private sector and the public authority will be focused on the coordination of invesments, general planning, auditing and policy making.

This model is used in large-scale economic and social infrastructure projects, but it generally stands on the construction and operation of roads, bridges, tunnels, light rail transportation systems, airports and air control systems, generation and allocation of energy, water and sewage system, water channel and distribution network project, communication and transportation, traffic control systems, security, tourism, manufacturing and housing construction, hospitals and sanitation facilities, education buildings, cultural, urban and rural infrasturcture areas, schools and public buildings. (IMF, 2006, p.1)

7. STRUCTURE OF PUBLIC PRIVATE PARTNERSHIP

The structure of Public Private Partnership can be analyzed in 6 stages. These stages are determination of project scope, forming of strategy, elimination process, negotiations, contracting and initiating of service delivery. (Acartürk & Keskin, 2012, pp.33-34)

In this section, all of them will be explained one by one.

7.1. Determination of Project Scope

The needs of the project are identified in order to determine the project scope and options are iterated for selection of requirements. At this stage, it is ascertained that the need for which the project was emerged and what kind of benefits will be provided when realized.

7.2. Forming of Strategy

The next phase after the project scope has been determined is the establishment of strategy. At this stage, bidding strategy has been determined. A tender group is formed for this purpose and regulated the output specification. Risk assessment is very important. In later stages, evaluated strategies are adopted.

7.3. Elimination Process

During the selection process, the proposals of the firms related to the projects are evaluated. The companies interested in the project submit their bids. It is important whether bidders provide preconditions or not. Companies passed pre-qualification stage are determined.

7.4. Negotiations

At this stage, negotiations are held with the private entities that have passed the pre-qualification and their bid is the best evaluated bid being substantialy responsive to bidding specifications for the service in question. In the negotiations, evaluations

are made within the framework of the contract terms. Contract is signed with the winning company. The contractual terms will be clarified in the next phase.

7.5. Contracting

In the end of bidding process parties enter into a contract. Therefore, it is a priority for the parties to adhere to this contract.

In the contract, signed between the public authority and the private entity; transfer of major risks, proper utilization of the money, and reimbursement criteria should have been taken into consideration.

7.6. Initiating of Service Delivery

In the final stage, the service defined in Public Private Partnership contract is executed. Therefore, at this stage the service is provided to the market. Thus, Public Private Partnership process ends with the realization of the service delivery.

8. REASONS FOR THE PREFERENCE OF PUBLIC PRIVATE PARTNERSHIP

Once in the beginning, PPP models have been used to provide finance required for infrastructure investments of the countries, however today, PPP models are used as a model which uses the operational skills of the private sector whilst providing the public sector abilities such as focusing on the investments coordination, general planning, auditing and strategic policy planning.

Usually, PPP provides full-scale advantages to states but for this to happen, it must to be formulated properly. The advantages and disadvantages of PPP can be summarized as in following.

8.1. Advantages and Disadvantages of Public Private Partnership

While the advantages or disadvantages of PPP model to be stated, the question should be asked that "Why is PPP preferred?

8.1.1. Advantages of Public Private Partnership

8.1.1.1. Creating Fiscal Space

Resource constrained governments moving towards to PPP have an understanding of creating additional opportunities for new financial operations. The idea of creating financial space means the creation of additional resources for major government expenditures. Creating financial space can be realized by several ways. Firstly, non-priority expenditures can be partially or completely cut. Secondly, additional revenues can be provided through the strengthening of tax management. Thirdly, the government can use the senorage power. Lastly, government can collect debt from internal or external resources. (Şahin & Uysal, 2012, p.162)

8.1.1.2. Local Governments' Relieves from Public Service Financial Burdens

The PPP model is an alternative model where local governments can apply to get rid of public service obligations. This model enables the private sector to participate in public sector investments and it allows to get rid of budgetary constraints at both local and central level of authority. One of the most important advantages of PPP is that large investments in the provision of public services can be carried out without the use of public funds and the expenditure of public authority is then reduced.

8.1.1.3. Ensuring Efficiency in Resource Distribution

The services and infrastructure projects that the public should implement from their own budget can be financed by private sector. Thus, it will be ensured that the public authority utilizes the financing to be invested in service and infrastructure projects in other fields. (Sarısu, 2008, p.200)

8.1.1.4. Risk Sharing

It is very significant to ensure a balanced risk sharing in a successful PPP project. In PPP, local governments transfer some of their operational risks to the private partner through capital, construction, environment, economic and political risks. The most important point in the risk distribution is that the public and private partners assume the risks that they can best manage. For instance, private partner can better manage the prices and costs or better manage the programs or tariffs. However, the public partner can make some attempts to achieve these benefits and it can gain advantages. Also, risk can be minimized as a result of the harmonization of cost and profit balance, and a better performance and efficiency can be achieved.

8.1.1.5. Increasing Efficiency and Productivity of Project

With the PPP model, public services can be offered in a more qualified and cost-effective manner with the aim of achieving maximum efficiency at minimum cost.

Additionally, by promoting technology transfer in PPP, better quality services can be provided.

8.1.1.6. Receiving Value for Money

Realization of risk transfer, outcome-based features, long-lasting contract periods, performance measurements and incentives, competition and management skills of the private sector play an important role of receiving value for money (Herpen,2002, p. 182.). Hence, a project can be achieved with low cost and high quality, different from traditional procurement method for the same quality service.

8.1.1.7. Advantages in Terms of Project Financiers

In addition to traditional banking and financing practices, financing companies and banks have opportunity to diversify their income resources and create more competitive resources by providing fund for PPP projects. Since the most of these financings are guaranteed by central or local governments, minimization of risks makes the issue more attractive. While the provision of financing by public guarantee helps the private sector to provide financing more easily; on the other hand, it prevents the possible interruptions in the construction of the facility and the provision of services.

8.1.1.8. Completion of Projects in Specific Time

In Public Private Partnership model, projects can be delivered in short time and realized within the budget limits and available resources. One of the most important reasons for this is that the private sector partner has a strong motivation to finish the project as soon as possible in order to start the flow of payment from public.

8.1.1.9. Reducing Public Debt Levels

As a result of reduction of public investment expenditures and risk sharing with the private sector, pressure on public budgets and public debts will be reduced.

8.1.1.10. Providing Dynamism to Public Authority

Private sector is more creative, efficient, effective, innovative and more flexible to maximize the profit. It is assumed that this dynamism and creativity of the private sector through PPPs will also affect the public authority. (Şahin & Uysal, 2012, p.167)

8.1.1.11. Promoting Economic Growth

Since PPP projects will increase the current account volume, taxes that are collected as a result of these transactions will also increase the public revenue. Hence, economic growth will be achieved.

8.1.1.12. New Market Opportunities

PPP is a model which provides new market opportunities to private sector. This situation has been contributing to increasing employment and taxes and similar revenues, transferring of technology, obtaining new resources resulted from the tendency of making investments by entrepreneurs at home and abroad and increasing the interaction with the external economies. (Mecek et al., 2015, p.186)

In addition, other advantages of projects that are realized with PPP models are listed below.

- Enabling realization of investments which needs high amount of financing.
- Fixing the investments and operation times of projects and budget for public benefit.
- Increasing the speed of projects realization.
- Utilization off-balance sheet financing techniques and private sector opportunities to realize more infrastructure investments and services with limited budget possibilities.
- As the public private partnership model often involves a long-term investment period, unlike the classical purchasing model which requires

the public authority to fund the entire project cost during the short construction period and reflect it to the public benefit; the construction cost of a long-term infrastructure project is also shared with the public for a long period of time.

- In this model, public services can be achieved in more quality and more economically. Also, it is possible to say that maximum efficiency is provided with minimum cost.

- Making a significant contribution to local economy.

- Optimal use of resources.

- Quick completion of the projects and quick delivering of goods and services.

- Being utilized of technology transfer, technical innovation and operational skills of private sector.

- Projects will be implemented with public private partnership model not only due to offering opportunities to private sector but also bringing innovations to provide sustainability of public services in water, energy and health sectors.

- Injustice taxation can be prevented in society with use of PPP model.

- Requested services can be realized in shorter time.

- Transfering of risks related to construction, finance and operation of the projects to the private sector.

- Owning a facility fully functionable for public authority.

8.1.2. Disadvantages of Public Private Partnership

8.1.2.1. Deficiencies in Accounting and Reporting Standards

In PPP models accounting and reporting of applications are not executed in common standards. Although some steps have been taken about this issue, these standards are not clarified. Financing records which could not be realized with certain standards, cause uncertainty over the budget prepared by governments.

8.1.2.2. Loss of Work Force

In case of the service and usage costs are provided from the facility income after the PPP projects are realized, expenditures should be reduced from time to time in order to paying of these costs to the private sector partner. One of the first methods which comes in mind is to terminate the employment contract of some personnel in order to have reduced the costs. For this reason, public workers may be fall out of work.

8.1.2.3. Complex Structure and Control Difficulties of Public Private Partnership

Due to the complex and detailed structure of public private partnership, in the event of the design and management are not made by professional teams, various disputes may arise between the parties during the investment and operation periods. Furthermore, these contracts may have the investment planning process to be more complex by reducing the general budget flexibility as it creates a long term obligation to pay publicly.

8.1.2.4. Lack of Transparency of Public Private Partnership Process

Suspect increases against to public private partnership due to inability to being transparent in public private partnership projects about the cost sharing of both public entity and private sector, total cost of the project and amount to be paid to private sector.

Also, it is mostly impossible that projects may be delayed because of the political discussion, public opposition and complex negotiations process. In addition, Public reaction may occur as the interest of foreign capital may evoke the alienation and capitulations. So, the opinion increases about this model that this is a new way of privatization. Furthermore, incorrect distribution of risks, errors such as insufficient or incomplete sanctions specifically made in contract design may cause long-term serious problems in this model. On the other hand, since the PPP has a long term nature of contracts, the general budget flexibility is reduced as it creates a long term obligation

to the source. Moreover, the size of Public Private Partnership projects may not be seen in the balance sheets as payments related to PPP practices are reflected as expenses. This is also an issue to be considered in terms of balance sheet technique. Besides, both public and private sector may exercise difficulty about knowledge and skill in implementing the long terms projects. Further, due to the higher cost of tender, competitiveness is limited in partnership models. Additionally, Public Private Partnership model may cause to monopolistic situation in the infrastructure services and higher cost for beneficiaries. Finally, due to the information shared in projects is a trade secret, accountability may decrease.

9. TYPES OF PUBLIC PRIVATE PARTNERSHIP

PPP models increase the role of public capital in the field of public service and to provide working opportunity for private sector in various areas such as infrastructure and health. In addition, it makes possible a flow of resource from public organizations to foreign or domestic companies within a legally guaranteed term of twenty-five years or longer. For this purpose, PPP models have been used in the construction of airports, ports, bridges, roads and railways, drinking water, sewage, waste water networks and reservoirs in the world especially in UK, France, Canada, USA. Also, PPPs have been widely used for construction and operation in many service areas such as hospitals, polyclinics, prisons, military barracks, court services, police stations, schools, environmental services, communication technology systems and public service buildings. (Güzelsarı, 2012, p.30)

The main reason for applying PPP models in the provision of public services is economic. Because of this, PPP models represent the contractual cooperation in accordance with a common goal of the public and private sector.

PPP models are distinguished from traditional projects in 3 aspects. (Bult-Spiering&Dewulf, 2006, pp.72- 73; Ramstedt, 2008, p.24) These are;

1. Private sector taking responsibility in all matters during the project.
2. Determination of outputs by public authority.
3. Transfer of risk to private sector.

There are different approaches about the use of private funding in public service delivery. However, the method which has the longest history among these, is concession method. The more advanced type of concession is called "Franchise".

Franchise means the use of an already constructed facility without restructure or redevelop of an infrastructure, it is only a partnership related to the operation phase, but in concession, a public facility is established and operated by private entity. Although the initial stage of franchise is seen different from the concession, it has been accepted as a kind of concession.

Another approach is service purchasing agreements. Purchasing agreements provide modern contract and financing frame for PPP. Today's modern template of public services has been developed in America, in 1980s.

The first developed facility purchase agreement model is the Build-Own-Operate(BOO) contract which is formed between the private sector parties. The distinctive feature of Build-Operate-Transfer model is the ownership of project/facility permanently owned by the private sector partner. With Build-Own-Operate(BOO) model, a facility is financed, built, owned and operated by private sector entity.

The another model is Build-Operate-Transfer(BOT). In this model, the private sector undertakes primary responsibility for funding, design, construction and operation phases of the project. After a certain period of time, project's control and official ownership are transferred back to the public sector. (Grimsey & Lewis, 2004, p.10) The most important feature of this model is to reduce external debt stocks of the public sector and to provide external resources through ensuring foreign capital inflow to the country. Also, Build-Operate-Transfer model (BOT) provides increase of production and service efficiency during the operation phase of facility by means of advanced technology used by private sector.

It is worth to mention that the important difference between Build-Own-Operate (BOO) and Build-Operate-Transfer (BOT) models is that in the end of the operation period ownership of facility belongs to public authority in Build-Operate-Transfer (BOT) model while in Build-Own-Operate (BOO) model, the ownership of the facility belongs to private sector.

In Design-Build-Financing-Operate (DBFO) model, there are two important points. First, the facility is designed and financed according to demands of public authority. Second, public authority is officially owner of the facility, although the ownership of public asset remains in the private sector for the duration of the contract. At the end of the period, temporary property of facility is transferred back to the public authority. In this model, private sector designs and constructs a new plant. After the plant is completed, ownership is transferred to the public authority however the operation of facility is continued by private sector. (Alican, 2008, p.35)

In Operation and Maintenance (OM) model, by the public authority, execution of maintenance works is awarded to private sector with seperate contracts. Public authority undertakes the responsibility for the financing and ownership of asset and pays a fee to the private sector for management costs during operation. (Robinson et al., 2010, p.7)

In Build-Operate (BO) model, project under the state monopoly is realized by private sector within the frame of a contract but private entity can not have any ownership over the facility or property where the service is performed. Therefore, constructed facilities are transferred to state institution at the end of the determined period of operation.

Build-Lease-Transfer (BLT) model is a sub-model of PPP incorporating financing of the construction, maintenance and repair services (given to private entity by Bidding) of the required facilities needed to carry out public services, by issuing concession rights of the real estate (of which the property belongs to public entity), following the completion of construction hiring to public sector for a determined period against an hiring rate and execution of complete services by private entity or execution of core services by public sector while execution of auxiliary services by private entity. (Uysal, 2017, p.172)

Revenue Partnership Model is a model which incorporates sharing of the revenue in accordance with the terms of the Contract that the project cost is met by the Contractor, as per the Project approved by the Bidding Authority. (Keşli, 2009, p.278)

In Transfer of Operation Rights model, the operation of a facility owned by the public sector is transferred to the private sector for a certain period of time. (Uysal, 2017, p.172)

It is also allowed to use private financing in public infrastructure procurement. This process, which started with new road construction and operation projects in 1994, was actually the rediscovery of the concessions in 1980s. In the UK, following the successful implementations, many countries have started to implement this model in their boundaries. While in the world the number of countries working on PPP

applications was around 10 in 1999, this number has now been increasing continuously.

The structure of Public Private Partnership model can be shown as the financing, execution and management of services.

Table 4: Structure and Management of Public Private Partnership Model

Financing	Execution / Management		
	Public	**Private**	
Public	Direct Operating	Bidder	
Private	Mixed Economy Partnership	Leasing	Partnership Sector
		Privilege	

Resource: Levrat, 1995, p.33

Moreover, two different approaches can be mentioned in PPP models.

In the first approach, private sector designs, builds and acquires public property which has been previously made, financed and owned by the public authority. Then, the private sector leases these facilities back to the public authority for long term. In the second approach, a budget is given to private sector by public authority for taking over and operation of public sector enterprise. (Sarısu, 2009, p.159)

As the basis of PPP, five methods are used; service procurement, transfer of operation rights, leasing, transfer of consession rights and build-operate-transfer agreements.

Table 5: PPP Models According to the Types of Agreement

Agreement Type	Ownership	Management& Operation	Capital Investment	Commercial Risk	Duration	Commercial Risk
Service	Public	Private/ Public	Public	Public	1 – 2	Public
Management	Public	Private	Public	Public	3 – 5	Public
Leasing	Public	Private	Public	Public/ Private	8 – 15	Public/ Private
Concession	Public	Private	Private	Public	25 – 30	Public
BOT	Public/ Private	Private	Private	Private	20	Private

Resource: Gökdemir, 2007, p.14

As shown in the Table 5; PPP applications can be extended from short term capital free contracts to concession agreements which include the design and construction of the capital asset, provision of the various services, financing of the whole construction and operation, joint ventures and partial privatizations.

Additionally, these models can be carried out by applying one or more of these methods together. Differences in purpose, method and scope may vary according to the countries in which they are applied.

SECTION II

PUBLIC PRIVATE PARTNERSHIP AND PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING EXPLANATIONS RELATED TO PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING

In this section, definition, structure, stages of public private partnership project finance modelling and the meaning of technical terms will be explained. In the project finance modelling, this information is used as input data and guide. They will help to provide better understanding to Public Private Partnership project finance modelling.

10. WHAT IS PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODEL?

Public Private Partnership Project Finance is a long-term financing resource in "non-recourse" or "limited recourse" structure in which credit and capital are used together and based on cash flow generated by project for reimbursement and valuation in order to finance long-term projects.

Infrastructure projects such as transportation, power plants, natural gas supply and distribution, high-budget private sector investments, real estate investment trust (reit) and privatizations can be given as examples for public private partnership project finance modelling.

For realization of the project, financial resources such as Export Credit Agencies(ECA), national and international commercial banks, project bonds, development finance institutions(DFI) such as World Bank(WB), International Finance Corporation(IFC), European Bank for Reconstruction and Development (EBRD), European Investment Bank(EIB) are needed.

Public private partnership project finance modelling provides some advantages for both investors and banks. Investors benefit from high-level financing provided by syndication possibilities and off-balance-sheet financing which are preffered for large-

scale investments and long term projects. Also, in a project finance modelling collaterals are limited to project assets and no reimbursement is made during the investment period, so it provides convenience to investors. Banks earn additional incomes such as arrangement fees, commitment fees, agency commission etc. without using balance-sheet. In addition, banks have low sunk cost risk by strictly following the project cash and loan ratios.

The structure of project finance modelling includes debt and equity rates, values that can be added to the credit such as contruction period interest, debt service account and timing, duration, costs, reimbursement schedule, operation period restrictions, dividend restrictions of capital credit withdrawal. All of them will be used in the third section while the example of public private partnership project finance modelling is tabulated.

Stages of Project Finance

Financial Close	Notice to Proceed	Commercial Operation Date	Loan Maturity

Project Development Period

Construction Period

Operation Period
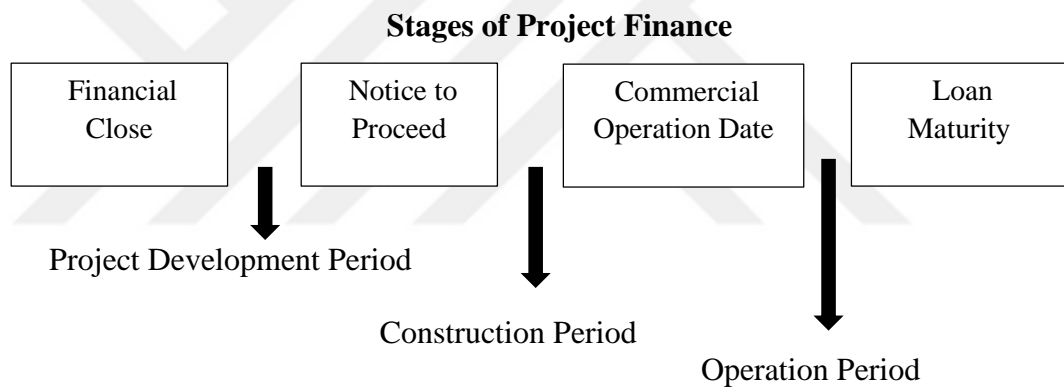
Project finance modelling can be used before financial closing and after.

In case that project finance modelling is used before financial closing, it provides preliminary evaluation of the project, determination of financial terms, formation of financial structure, determination of sponsor benefits and basic scenario.

In case that project finance modelling is used after financial closing, it is used as a project realization follow-up tool. It provides to creditors a control mechanism on long-term project revenues.

10.1. Inputs Used in Project Finance Modelling

Inputs include macro-economic forecasts, project costs, structure of funding, operational incomes & expenses, credit terms & reimbursement, tax & accounting assumptions and dividend payments.

In the third part it has been explained that the price and production values of nickel, which are used in the calculation of nickel sales, are effected by macroeconomic forecasts such as inflation, input costs, interest rates, currency and parity variables.

Project costs include Capital Expenditures (CAPEX). These are investment costs (cost before financial closing), EPC (Engineering, Procurement, Construction) contract value, construction period insurance, permission and license fees, start-up costs, initial spare part orders, working capital, taxes, Interest During Construction (IDC), Debt Service Reserve Account (DSRA) and other unknown costs.

Operational incomes are the first year production and sales.

OPERATIONAL INCOMES	MINUS →	**Operational Expenses** • Raw Materials • Insurance • Operation and Maintenance contract value- if it is a service taken from outside.
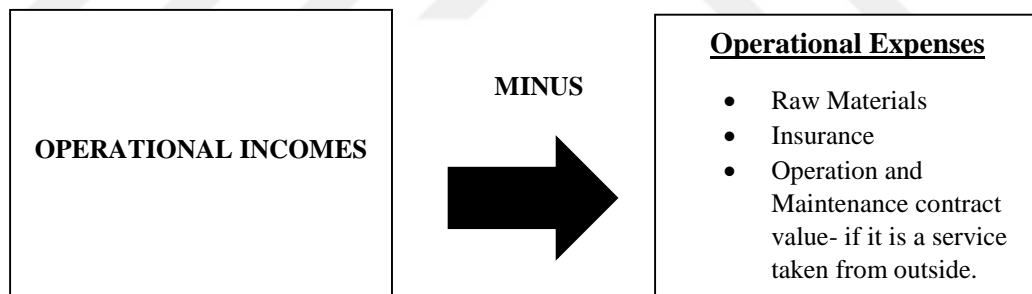
In the calculation of tax & accounting assumptions the main purpose is to establish a reliable cash flow. For this reason, accounting profitability is very important in terms of cash flow because it determines at what time payments are made to dividends.

Concerning to divident payments, project company may have money, however dividend payments can not be made due to lack of profitability and other conditions. In such a case, inputting the shareholder loan instead of capital can be a solution.

10.2. Outputs Used in Project Finance Modelling

Outputs include project cost and funding, equity terms, credit terms & reimbursement, financial statements, financial ratios, average loan maturity, equity efficiency, Net Present Value (NPV), Internal Rate of Return (IRR), payback, Debt Coverage Ratio(DCR) which cover Debt Service Coverage Ratio (DSCR), Loan Life Coverage Ratio(LLCR), Project Life Coverage Ratio (LCR),

Net present value is downloading of future earnings with a certain interest or discount rate to starting year.

Internal Rate of Return (IRR) is a discount rate that equals the present value of the future cash flow to the value invested today. Net present value should be considered together with pay back. (Inputs=Outputs)

Payback is an important factor for the evaluation of investment. It shows the time that the investment is paid back. IRR and NPV may be positive value but payback of investment is a crucial factor for decision making. Also, long-term returns may not be attractive for every investor.

Debt Coverage Ratio (DCR) covers Debt Service Coverage Ratio (DSCR), Loan Life Coverage Ratio (LLCR), Project Life Coverage Ratio (PLCR).

Debt Service Coverage Ratio (DSCR) measures the payment power within a certain period.

Loan Life Coverage Ratio (LLCR) measures the payment power of entire debt.

Project Life Coverage Ratio (PLCR) measures the payment power of debt in the remaining period of the project.

SECTION III
EXAMPLE RELATED TO PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING

In this part, model inputs that include the macroeconomic assumptions, project costs and funding structure, operational incomes and expenses, use of credit and repayment, tax and accounting assumptions are shown in tabular form. By means of these data, project finance modelling is formed on main values then calculations made. Finally, the cost of project and the profitability of the investment are evaluated in accordance with the following calculations.

1. **Purpose and Importance of the Study**: With the example of PPP project finance modelling it has been aimed to show how the PPP project finance modelling is created with macroeconomic and technical assumptions in tabular form, which formulas and iterations are used during the calculations and how the profitability analysis of the investment is evaluated. In this study, public private partnership project finance modelling is adapted to nickel mine operation with Build-Operate-Transfer model.

The importance of this study is how create the project finance model during the forming stage of a public private partnership. Hereby, both public and private sector will decide to invest or not to any project according to evaluation results of profitability analysis of the investment through project finance modelling.

2. **Sample of Research:** An example of Public Private Partnership Project Finance Modelling within the Build-Operate-Tansfer model is given below, as an operation of a nickel mine owned by Ministry of Natural Resources, Kazakhstan (MNR). The mine operation concession right for 20 years is granted to the company called NickTOLL, a private entity of a British and Kazakh companies in partnership. The land is handed over as freely accessible to NickTOLL.

NickTOLL has committed to pay USD 750.000.000 to MNR for the total operation period of 20 years. This modelling analyses the financial profitability analysis to NickTOLL and to the Ministry of Natural Resources, Kazakhstan.

In the generation of project finance modelling; financial datas, monetary units, numbers and currencies are approximate values close to real datas. This is a typical PPP Agreement.

3.   Analysis of Research Data: In the study, research datas are analyzed by excel tables, formulas and iterations. Explanations of each tables, formulas and iterations are given during the work.

4.   Research Findings: At the end of the study, purpose is to reach appropriate average and minimum Debt Service Coverage Ratio (DSCR), Internal Rate of Return (IRR) for both equity and project cash flow and Loan Life Coverage Ratio (LLCR) values determined by bank(s) through the calculation of Net Present Value (NPV), Weighted Average Cost of Capital (WACC) and Discount Cash Flow (DCF). When the average and minimum Debt Service Coverage Ratio, Internal Rate of Return and Loan Life Coverage Ratio values are above of the limit determined by bank(s), it can be said that the project is feasible for investment. On the other hand, these datas are important to measure the profitability of investment.

11. EXAMPLE RELATED TO PUBLIC PRIVATE PARTNERSHIP PROJECT FINANCE MODELLING

In the next coming pages, Public Private Partnership Project Finance Modelling is shown step by step.

Table 6: Project Summary

Key dates		
Financial close date		1-Dec-19
Commercial operations date		1-Jan-22
Price base date		1-Jan-19

Finance plan:		mio$
Engineering, procurement and const	76.8%	505.0
Land	-	-
Development Fees	0.5%	3.0
Owner's Engineer (Contruction phase	0.5%	3.5
Legal Consultancy Fees	0.2%	1.0
Development Costs	0.8%	5.0
Insurance	0.4%	2.5
Contingency	1.2%	8.0
Working Capital Needs	1.6%	10.5
IDC +fees	11.8%	77.9
DSRA	6.3%	41.3
Total financing required	**100.0%**	**657.7**
Common equity	100.0%	197.3
Shareholder loan	-	-
Total equity	**30.0%**	**197.3**
Debt		460.4
Total debt	**70.0%**	**460.4**
Total financing provided	**100.0%**	**657.7**

Debt Covenants		
Ratios		
DSCR minimum	2.56	
DSCR average	3.59	
LLCR minimum	1.84	
LLCR average	2.59	
Debt Service Reserve Account Max Balance(€'millions)	64.5	

Returns		
Project IRR	50.62%	
Equity IRR	42.08%	
Project NPV mio$	842.9	
Equity NPV mio$	752.2	

11.1. Inputs

Table 7: Inputs

	Sheet	Amount	
Project Capital Expenditures-CAPEX			
EPC	EPC	$505,000,000	
Plant & machinery		$425,000,000	
Pre-operative expenses		$30,000,000	
Buildings		$50,000,000	
Land	Project Developme	$0	
Development Fees	Project Developme	$3,000,000	
Owner's Engineer (Contruction phase)	Project Developme	$3,500,000	
Legal Consultancy Fees	Project Developme	$1,000,000	
Development Costs	Project Developme	$5,000,000	
Insurance	Insurance	$2,500,000	
Contingency	Project Developme	$8,000,000	
Working Capital Needs		$10,464,426	
IDC+ Fees		$77,805,882	
DSRA		$41,263,537	
Total CAPEX		**$657,533,845**	
Production			
Annual Net Nickel Production	LTPA	110,000	tons
Nickel Price/ Long Term Purchasing Agreement			
Term of PPA	LTPA	20	years
Price	LTPA	$12,000.00	$/ton
Price Base Date	LTPA	1-Jan-19	
Operational Expenses (Opex)			
Variable Expenses			
Number of years of variable O&M	O&M	20	years
Variable O&M Expenses	O&M	$1,760.000	$/MWh
Fixed Costs			
Number of years of variable O&M	O&M	20	years
Service	O&M	$64,000,000	
Personnel	O&M	$50,000,000	
Spare parts	O&M	$15,000,000	
Maintenance	O&M	$25,000,000	
Administrative expenses	O&M	$50,000,000	
Fees to MNR	O&M	$750,000,000	
Total Fixed Costs		**$954,000,000**	

Table 7.1: Inputs (cont)

Taxes

Corporate Tax rate	General	20%
VAT	General	18%

Working Capital

Payables	O&M	45	Days
Receivables	LTPA	30	Days
Beginning Cash required		10	Days
Beginning Cash required		$5,464,426	
Initial Spare Parts	O&M	$5,000,000	
Total Working Capital Required		**$10,464,426**	

Insurance

Construction Phase

All-risk	Insurance	$1,500,000.00
Delay in Start-up	Insurance	$1,000,000.00
Total		**$2,500,000**

Operation Phase

Operator's All Risk	Insurance	$1,000,000.00
Business Interruption (BI)	Insurance	$1,000,000.00
Third Party Liability	Insurance	$750,000.00
Employer's Workers Compensation	Insurance	$750,000.00
Total		**$3,500,000**

Project Timeline

Financial Close (FC)	General	1-Dec-19
FC to NTP terms-months	General	1
Notice to Proceed (NTP)		1-Jan-20
Construction duration		24 months
Commercial Operation Date		1-Jan-22

Financing

Total Debt Used %	Financing	70%
Equity %	Financing	30%
Total Project Cost		$657,533,845
Total Debt Used		$460,273,692
Total Equity Required		$197,260,154

Table 7.2: Inputs (cont)

Macroeconomic Assumptions

Inflation	General	1.50%
Currency	General	USD
Corporate tax rate	General	20%
VAT	General	18%

Loan Details

Libor	General	3%	
Loan Interest Margin (libor +)	Financing	4%	
Interest Rate		7%	
Loan Start Date		1-Jan-20	
Loan Tenor	Financing	15	years
Loan Repayment per year	Financing	2	
Total Loan Repayment		30	
DSRA number of months to reserve	Financing	12	
Arrangement Fee	Financing	1.50%	
Commitment Fee	Financing	1%	

Depreciation

Total Capex		20 years

Dividend

Dividend distribution allowance (% of net Financing		100%

Table 7.3: Inputs – (EPC Schedule)

EPC Schedule	NTP+ months	Date	% Payment	Amount	EOMONTH
NTP-Notice to Proceed	0	1-Jan-20	10.00%	$50,500,000.00	31/01/20
Construction Start	1	1-Feb-20	3%	$15,150,000.00	29/02/20
	2	1-Mar-20	3%	$15,150,000.00	31/03/20
	3	1-Apr-20	3%	$15,150,000.00	30/04/20
	4	1-May-20	3%	$15,150,000.00	31/05/20
	5	1-Jun-20	3%	$15,150,000.00	30/06/20
	6	1-Jul-20	3%	$15,150,000.00	31/07/20
	7	1-Aug-20	3%	$15,150,000.00	31/08/20
	8	1-Sep-20	3%	$15,150,000.00	30/09/20
	9	1-Oct-20	3%	$15,150,000.00	31/10/20
	10	1-Nov-20	3%	$15,150,000.00	30/11/20
	11	1-Dec-20	3%	$15,150,000.00	31/12/20
	12	1-Jan-21	12%	$60,600,000.00	31/01/21
	13	1-Feb-21	5%	$25,250,000.00	28/02/21
	14	1-Mar-21	5%	$25,250,000.00	31/03/21
	15	1-Apr-21	5%	$25,250,000.00	30/04/21
	16	1-May-21	5%	$25,250,000.00	31/05/21
	17	1-Jun-21	5%	$25,250,000.00	30/06/21
	18	1-Jul-21	5%	$25,250,000.00	31/07/21
	19	1-Aug-21	0%	$0.00	31/08/21
	20	1-Sep-21	0%	$0.00	30/09/21
Construction End	21	1-Oct-21	5%	$25,250,000.00	31/10/21
Test Period	22	1-Nov-21	0%	$0.00	30/11/21
Test Period	23	1-Dec-21	10%	$50,500,000.00	31/12/21
Commercial Operation Da	24	1-Jan-22	0%	$0.00	31/01/22
Total			100.00%	$505,000,000.00	

11.2. Operations

Revenues from Operations (Nickel Sales)

Revenues from nickel sales for the whole operation period of 20 years (2020-2041) are calculated for each year. Yearly nickel (ton) price are escalated by inflation rate.

Operational Expenses (OPEX)

Fixed O&M Costs are yearly calculated taking into account Total Fixed O&M Cost, Inflation and Operation indexes.

Variable O&M Costs yearly calculated considering Inflation and Production indexes.

Total Operational Cost (OPEX) is the sum of Fixed and Variable O&M Costs.

Table 8: Operations

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
		0	1	2	3	4	5	6	7	8	9	10	11
Inflation		1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Inflation Index		1.00	1.02	1.03	1.05	1.06	1.08	1.09	1.11	1.13	1.14	1.16	1.18
Operation Index		0%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
REVENUES													
Nickel Production	tons	$0	$0	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000
Nickel Price		$12,000	$12,180	$12,363	$12,548	$12,736	$12,927	$13,121	$13,318	$13,518	$13,721	$13,926	$14,135
Nickel Sales	$	$0	$0	$1,359,897,000	$1,380,295,455	$1,400,999,887	$1,422,014,885	$1,443,345,108	$1,464,995,285	$1,486,970,214	$1,509,274,768	$1,531,913,889	$1,554,892,597
OPEX													
Fixed O&M		$0	$0	$982,834,650	$997,577,170	$1,012,540,827	$1,027,728,940	$1,043,144,874	$1,058,792,047	$1,074,673,928	$1,090,794,037	$1,107,155,947	$1,123,763,286
Variable O&M		$0	$0	$199,451,560	$202,443,333	$205,479,983	$208,562,183	$211,690,616	$214,865,975	$218,088,965	$221,360,299	$224,680,704	$228,050,914
Total Opex	$	$0	$0	$1,182,286,210	$1,200,020,503	$1,218,020,811	$1,236,291,123	$1,254,835,490	$1,273,658,022	$1,292,762,892	$1,312,154,336	$1,331,836,651	$1,351,814,201

		2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
		12	13	14	15	16	17	18	19	20	21
Inflation		1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Inflation Index		1.20	1.21	1.23	1.25	1.27	1.29	1.31	1.33	1.35	1.37
Operation Index		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
REVENUES											
Nickel Production	tons	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000	$110,000
Nickel Price		$14,347	$14,563	$14,781	$15,003	$15,228	$15,456	$15,688	$15,923	$16,162	$16,405
Nickel Sales	$	$1,578,215,986	$1,601,889,226	$1,625,917,565	$1,650,306,328	$1,675,060,923	$1,700,186,837	$1,725,689,639	$1,751,574,984	$1,777,848,609	$1,804,516,338
OPEX											
Fixed O&M		$1,140,619,736	$1,157,729,032	$1,175,094,967	$1,192,721,392	$1,210,612,212	$1,228,771,396	$1,247,202,967	$1,265,911,011	$1,284,899,676	$1,304,173,171
Variable O&M		$231,471,678	$234,943,753	$238,467,909	$242,044,928	$245,675,602	$249,360,736	$253,101,147	$256,897,664	$260,751,129	$264,662,396
Total Opex	$	$1,372,091,414	$1,392,672,785	$1,413,562,877	$1,434,766,320	$1,456,287,814	$1,478,132,132	$1,500,304,114	$1,522,808,675	$1,545,650,806	$1,568,835,568

11.3. Capital Expenditure (CAPEX)

CAPEX values are calculated taking into account of the following values. During construction period (2020-2021); EPC, Development Fees, Owner's Engineer (construction phase), Legal Consultancy, Development Costs, Insurance, Contingency, Working Capital and IDC + Fees are paid for the construction period as shown in the table.

Table 9: CAPEX

			1-Jan-20 31-Jan-20	1-Feb-20 29-Feb-20	1-Mar-20 31-Mar-20	1-Apr-20 30-Apr-20	1-May-20 31-May-20	1-Jun-20 30-Jun-20	1-Jul-20 31-Jul-20
Capex Schedule			**2020**	**2020**	**2020**	**2020**	**2020**	**2020**	**2020**
EPC	$505,000,000	100%	10%	3%	3%	3%	3%	3%	3%
Land	$0	100%	100%						
Development Fees	$3,000,000	100%	100%						
Owner's Engineer (Contruction phase)	$3,500,000	100%	25%						
Legal Consultancy Fees	$1,000,000	100%	100%						
Development Costs	$5,000,000	100%	100%						
Insurance	$2,500,000	100%	100%						
Contingency	$8,000,000	100%	100%						
Working Capital Needs	$10,464,426	100%	0%						
IDC + Fees	$77,805,882	100%	100%						
DSRA	$41,263,537	100%							

			1-Aug-20 31-Aug-20	1-Sep-20 30-Sep-20	1-Oct-20 31-Oct-20	1-Nov-20 30-Nov-20	1-Dec-20 31-Dec-20	1-Jan-21 31-Jan-21	1-Feb-21 28-Feb-21	1-Mar-21 31-Mar-21
Capex Schedule			**2020**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**
EPC	$505,000,000	100%	3%	3%	3%	3%	3%	12%	5%	5%
Land	$0	100%								
Development Fees	$3,000,000	100%								
Owner's Engineer (Contruction phase)	$3,500,000	100%								
Legal Consultancy Fees	$1,000,000	100%	"					25%		
Development Costs	$5,000,000	100%								
Insurance	$2,500,000	100%								
Contingency	$8,000,000	100%								
Working Capital Needs	$10,464,426	100%								
IDC + Fees	$77,805,882	100%								
DSRA	$41,263,537	100%								

Table 9.1: CAPEX (cont)

			1-Apr-21 30-Apr-21	1-May-21 31-May-21	1-Jun-21 30-Jun-21	1-Jul-21 31-Jul-21	1-Aug-21 31-Aug-21	1-Sep-21 30-Sep-21	1-Oct-21 31-Oct-21	1-Nov-21 30-Nov-21
Capex Schedule			**2021**	**2021**	**2021**	**2021**	**2021**	**2021**	**2021**	**2021**
EPC	$505,000,000	100%	5%	5%	5%	5%	0%	0%	5%	0%
Land	$0	100%								
Development Fees	$3,000,000	100%								
Owner's Engineer (Contruction phase)	$3,500,000	100%			25%					
Legal Consultancy Fees	$1,000,000	100%								
Development Costs	$5,000,000	100%								
Insurance	$2,500,000	100%								
Contingency	$8,000,000	100%								
Working Capital Needs	$10,464,426	100%								
IDC + Fees	$77,805,882	100%								
DSRA	$41,263,537	100%								

			1-Dec-21 31-Dec-21	1-Jan-22 31-Jan-22	1-Feb-22 28-Feb-22	1-Mar-22 31-Mar-22	1-Apr-22 30-Apr-22	1-May-22 31-May-22	1-Jun-22 30-Jun-22
Capex Schedule			**2021**	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**
EPC	$505,000,000	100%	10%	0%	0%	0%	0%	0%	0%
Land	$0	100%							
Development Fees	$3,000,000	100%							
Owner's Engineer (Contruction phase)	$3,500,000	100%	25%						
Legal Consultancy Fees	$1,000,000	100%							
Development Costs	$5,000,000	100%							
Insurance	$2,500,000	100%							
Contingency	$8,000,000	100%							
Working Capital Needs	$10,464,426	100%							
IDC + Fees	$77,805,882	100%							
DSRA	$41,263,537	100%							

Table 9.2: CAPEX (cont)

Capex Schedule			1-Jul-22 31-Jul-22 2022	1-Aug-22 31-Aug-22 2022	1-Sep-22 30-Sep-22 2022	1-Oct-22 31-Oct-22 2022	1-Nov-22 30-Nov-22 2022	1-Dec-22 31-Dec-22 2022
EPC	$505,000,000	100%	0%	0%	0%	0%	0%	0%
Land	$0	100%						
Development Fees	$3,000,000	100%						
Owner's Engineer (Contruction phase)	$3,500,000	100%						
Legal Consultancy Fees	$1,000,000	100%						
Development Costs	$5,000,000	100%						
Insurance	$2,500,000	100%						
Contingency	$8,000,000	100%						
Working Capital Needs	$10,464,426	100%						
IDC + Fees	$77,805,882	100%						
DSRA	$41,263,537	100%						

CAPEX is the sum of below mentioned costs.

Table 10: Costs of CAPEX Values

Capex				1-Jan-20 31-Jan-20	1-Feb-20 29-Feb-20	1-Mar-20 31-Mar-20	1-Apr-20 30-Apr-20	1-May-20 31-May-20	1-Jun-20 30-Jun-20	1-Jul-20 31-Jul-20
EPC	$505,000,000		$0	$50,500,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000
Land	$0		$0	$0	$0	$0	$0	$0	$0	$0
Development Fees	$3,000,000		$0	$3,000,000	$0	$0	$0	$0	$0	$0
Owner's Engineer (Contruction phase)	$3,500,000		$0	$875,000	$0	$0	$0	$0	$0	$0
Legal Consultancy Fees	$1,000,000		$0	$1,000,000	$0	$0	$0	$0	$0	$0
Development Costs	$5,000,000		$0	$5,000,000	$0	$0	$0	$0	$0	$0
Insurance	$2,500,000		$0	$2,500,000	$0	$0	$0	$0	$0	$0
Contingency	$8,000,000		$0	$8,000,000	$0	$0	$0	$0	$0	$0
Working Capital Needs	$10,464,426		$0	$0	$0	$0	$0	$0	$0	$0
IDC + Fees	$77,805,882		$0	$77,805,882	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537		$0	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**		**$0**	**$148,680,882**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**

Table 10.1: Costs of CAPEX Values (cont)

Capex			1-Apr-21 30-Apr-21	1-May-21 31-May-21	1-Jun-21 30-Jun-21	1-Jul-21 31-Jul-21	1-Aug-21 31-Aug-21	1-Sep-21 30-Sep-21	1-Oct-21 31-Oct-21	1-Nov-21 30-Nov-21
EPC	$505,000,000	$0	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$60,600,000	$25,250,000	$25,250,000
Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development Fees	$3,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Owner's Engineer (Contruction phase)	$3,500,000	$0	$0	$0	$0	$0	$0	$875,000	$0	$0
Legal Consultancy Fees	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development Costs	$5,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$2,500,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Contingency	$8,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital Needs	$10,464,426	$0	$0	$0	$0	$0	$0	$0	$0	$0
IDC + Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$61,475,000**	**$25,250,000**	**$25,250,000**

Capex			1-Aug-20 31-Aug-20	1-Sep-20 30-Sep-20	1-Oct-20 31-Oct-20	1-Nov-20 30-Nov-20	1-Dec-20 31-Dec-20	1-Jan-21 31-Jan-21	1-Feb-21 28-Feb-21	1-Mar-21 31-Mar-21
EPC	$505,000,000	$0	$25,250,000	$25,250,000	$25,250,000	$25,250,000	$0	$0	$25,250,000	$0
Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development Fees	$3,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Owner's Engineer (Contruction phase)	$3,500,000	$0	$0	$0	$875,000	$0	$0	$0	$0	$0
Legal Consultancy Fees	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development Costs	$5,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$2,500,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Contingency	$8,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital Needs	$10,464,426	$0	$0	$0	$0	$0	$0	$0	$0	$0
IDC + Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$25,250,000**	**$25,250,000**	**$26,125,000**	**$25,250,000**	**$0**	**$0**	**$25,250,000**	**$0**

Table 10.2: Costs of CAPEX Values (cont)

Capex			1-Dec-21 31-Dec-21	1-Jan-22 31-Jan-22	1-Feb-22 28-Feb-22	1-Mar-22 31-Mar-22	1-Apr-22 30-Apr-22	1-May-22 31-May-22	1-Jun-22 30-Jun-22
EPC	$505,000,000	$0	$50,500,000	$0	$0	$0	$0	$0	$0
Land	$0	$0	$0	$0	$0	$0	$0	$0	$0
Development Fees	$3,000,000	$0	$0	$0	$0	$0	$0	$0	$0
Owner's Engineer (Contruction phase)	$3,500,000	$0	$875,000	$0	$0	$0	$0	$0	$0
Legal Consultancy Fees	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0
Development Costs	$5,000,000	$0	$0	$0	$0	$0	$0	$0	$0
Insurance	$2,500,000	$0	$0	$0	$0	$0	$0	$0	$0
Contingency	$8,000,000	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital Needs	$10,464,426	$0	$10,464,426	$0	$0	$0	$0	$0	$0
IDC + Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$41,263,537	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$103,102,963**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Capex			1-Jul-22 31-Jul-22	1-Aug-22 31-Aug-22	1-Sep-22 30-Sep-22	1-Oct-22 31-Oct-22	1-Nov-22 30-Nov-22	1-Dec-22 31-Dec-22
EPC	$505,000,000	$0	$0	$0	$0	$0	$0	$0
Land	$0	$0	$0	$0	$0	$0	$0	$0
Development Fees	$3,000,000	$0	$0	$0	$0	$0	$0	$0
Owner's Engineer (Contruction phase)	$3,500,000	$0	$0	$0	$0	$0	$0	$0
Legal Consultancy Fees	$1,000,000	$0	$0	$0	$0	$0	$0	$0
Development Costs	$5,000,000	$0	$0	$0	$0	$0	$0	$0
Insurance	$2,500,000	$0	$0	$0	$0	$0	$0	$0
Contingency	$8,000,000	$0	$0	$0	$0	$0	$0	$0
Working Capital Needs	$10,464,426	$0	$0	$0	$0	$0	$0	$0
IDC + Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Pro-rata Debt & Equity Withdrawals

Pro-rata Debt & Equity Withdrawals are calculated considering the Total Capex. Pro-rata Debt is calculated considering the ratio of Total Debt Used (%70)- see input (Total CAPEX x Ratio of Total Debt Used).

Equity Withdrawals is calculated as the same way considering the ratio of Equity (%30) – see input (Total CAPEX x Ratio of Equity)

Table 11: Pro-rata Debt & Equity

Pro-rata Debt & Equity Withdrawal		1-Jan-20 31-Jan-20	1-Feb-20 29-Feb-20	1-Mar-20 31-Mar-20	1-Apr-20 30-Apr-20	1-May-20 31-May-20	1-Jun-20 30-Jun-20	1-Jul-20 31-Jul-20	1-Aug-20 31-Aug-20
Debt	$460,273,692	$104,076,618	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000
Equity	$197,260,154	$44,604,265	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000
	$657,533,845								

Pro-rata Debt & Equity Withdrawal		1-Sep-20 30-Sep-20	1-Oct-20 31-Oct-20	1-Nov-20 30-Nov-20	1-Dec-20 31-Dec-20	1-Jan-21 31-Jan-21	1-Feb-21 28-Feb-21	1-Mar-21 31-Mar-21	1-Apr-21 30-Apr-21
Debt	$460,273,692	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$43,032,500	$17,675,000	$17,675,000	$17,675,000
Equity	$197,260,154	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$18,442,500	$7,575,000	$7,575,000	$7,575,000
	$657,533,845								

Table 11.1: Pro-rata Debt & Equity (cont)

Pro-rata Debt & Equity Withdrawal		1-May-21 31-May-21	1-Jun-21 30-Jun-21	1-Jul-21 31-Jul-21	1-Aug-21 31-Aug-21	1-Sep-21 30-Sep-21	1-Oct-21 31-Oct-21	1-Nov-21 30-Nov-21	1-Dec-21 31-Dec-21
Debt	$460,273,692	$17,675,000	$18,287,500	$17,675,000	$0	$0	$17,675,000	$0	$72,172,074
Equity	$197,260,154	$7,575,000	$7,837,500	$7,575,000	$0	$0	$7,575,000	$0	$30,930,889
	$657,533,845								

Pro-rata Debt & Equity Withdrawal		1-Jan-22 31-Jan-22	1-Feb-22 28-Feb-22	1-Mar-22 31-Mar-22	1-Apr-22 30-Apr-22	1-May-22 31-May-22	1-Jun-22 30-Jun-22	1-Jul-22 31-Jul-22	1-Aug-22 31-Aug-22
Debt	$460,273,692	$0	$0	$0	$0	$0	$0	$0	$0
Equity	$197,260,154	$0	$0	$0	$0	$0	$0	$0	$0
	$657,533,845								

Pro-rata Debt & Equity Withdrawal		1-Sep-22 30-Sep-22	1-Oct-22 31-Oct-22	1-Nov-22 30-Nov-22	1-Dec-22 31-Dec-22
Debt	$460,273,692	$0	$0	$0	$0
Equity	$197,260,154	$0	$0	$0	$0
	$657,533,845				

<u>Interest During Construction + Fees Calculation</u>

- Beginning Equity, in the past month of construction no equity is used. However, in the following month beginning E_1= Equity Withdrawal + Ending Equity of the previous month.

- Equity value is used in the past month of construction (January 2020) for Equity Withdrawal.

- Ending Equity is the sum of Beginning Equity + Equity Withdrawal.

- Beginning Loan Balance is zero for the past month of construction due to no loan is used. However, in the following month beginning L_1= Debt Withdrawal + Ending Loan of the previous month.

  Debt value is used in the month of construction (January 2020) for Debt Withdrawal.

  Ending Loan is the sum of Beginning Loan + Debt Withdrawal.

  Unused Loan Balance is calculated monthly considering Total Debt – Ending Loan Balance in the first month of construction.

- Commitment Fee is calculated monthly as Unused Loan Balance x Commitment Fee percentage (%1 ÷ 12) – see Inputs.

- Arrangement Fee is calculated monthly as Total Debt Used x Arrangement Fee as paid in the first month of construction.

- Interest for the Period is calculated monthly as Ending Loan Balance x Interest Rate (%7) – see Inputs.

- Total Fees is the sum of Commitment and Arrangement Fee.

- Interest + Fees is the sum of Total Fees and Interest.

Table 12: IDC + Fees Calculation

IDC & Fees Calculation		1-Jan-20 31-Jan-20	1-Feb-20 29-Feb-20	1-Mar-20 31-Mar-20	1-Apr-20 30-Apr-20	1-May-20 31-May-20	1-Jun-20 30-Jun-20	1-Jul-20 31-Jul-20
Beginning Equity		0	$44,604,265	$49,149,265	$53,694,265	$58,239,265	$62,784,265	$67,329,265
Equity withdrawal		$44,604,265	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000
Ending Equity		$44,604,265	$49,149,265	$53,694,265	$58,239,265	$62,784,265	$67,329,265	$71,874,265
Begining Loan Balance		0	$104,076,618	$114,681,618	$125,286,618	$135,891,618	$146,496,618	$157,101,618
Debt Withdraw		$104,076,618	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000
Ending Loan Balance		$104,076,618	$114,681,618	$125,286,618	$135,891,618	$146,496,618	$157,101,618	$167,706,618
Unused Loan Balance		$356,197,074	$345,592,074	$334,987,074	$324,382,074	$313,777,074	$303,172,074	$292,567,074
Commitment Fee	$4,084,700.17	$296,830.90	$287,993.40	$279,155.90	$270,318.40	$261,480.90	$252,643.40	$243,805.90
Arrangement Fee	$6,904,105.37	$6,904,105.37						
Interest for the period	$66,817,076.47	$607,113.60	$624,377.70	$730,838.60	$766,277.73	$854,563.60	$885,878.57	$978,288.60
Total fees	$10,988,805.54	$7,200,936.27	$287,993.40	$279,155.90	$270,318.40	$261,480.90	$252,643.40	$243,805.90
Interest + Fees	$77,805,882.01	$7,808,049.87	$912,371.09	$1,009,994.50	$1,036,596.13	$1,116,044.50	$1,138,521.96	$1,222,094.50

Table 12.1: IDC + Fees Calculation (cont)

IDC & Fees Calculation		1-Aug-20 31-Aug-20	1-Sep-20 30-Sep-20	1-Oct-20 31-Oct-20	1-Nov-20 30-Nov-20	1-Dec-20 31-Dec-20	1-Jan-21 31-Jan-21	1-Feb-21 28-Feb-21
Beginning Equity		$71,874,265	$76,419,265	$80,964,265	$85,509,265	$90,054,265	$94,599,265	$113,041,765
Equity withdrawal		$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$18,442,500	$7,575,000
Ending Equity		$76,419,265	$80,964,265	$85,509,265	$90,054,265	$94,599,265	$113,041,765	$120,616,765
Begining Loan Balance		$167,706,618	$178,311,618	$188,916,618	$199,521,618	$210,126,618	$220,731,618	$263,764,118
Debt Withdraw		$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$43,032,500	$17,675,000
Ending Loan Balance		$178,311,618	$188,916,618	$199,521,618	$210,126,618	$220,731,618	$263,764,118	$281,439,118
Unused Loan Balance		$281,962,074	$271,357,074	$260,752,074	$250,147,074	$239,542,074	$196,509,574	$178,834,574
Commitment Fee	$4,084,700.17	$234,968.40	$226,130.90	$217,293.40	$208,455.90	$199,618.40	$163,757.98	$149,028.81
Arrangement Fee	$6,904,105.37							
Interest for the period	$66,817,076.47	$1,040,151.10	$1,065,279.82	$1,163,876.10	$1,184,880.65	$1,287,601.10	$1,538,624.02	$1,477,555.37
Total fees	$10,988,805.54	$234,968.40	$226,130.90	$217,293.40	$208,455.90	$199,618.40	$163,757.98	$149,028.81
Interest + Fees	$77,805,882.01	$1,275,119.50	$1,291,410.71	$1,381,169.50	$1,393,336.54	$1,487,219.50	$1,702,382.00	$1,626,584.18

Table 12.2: IDC + Fees Calculation (cont)

IDC & Fees Calculation		1-Mar-21 31-Mar-21	1-Apr-21 30-Apr-21	1-May-21 31-May-21	1-Jun-21 30-Jun-21	1-Jul-21 31-Jul-21	1-Aug-21 31-Aug-21	1-Sep-21 30-Sep-21
Beginning Equity		$120,616,765	$128,191,765	$135,766,765	$143,341,765	$151,179,265	$158,754,265	$158,754,265
Equity withdrawal		$7,575,000	$7,575,000	$7,575,000	$7,837,500	$7,575,000	$0	$0
Ending Equity		$128,191,765	$135,766,765	$143,341,765	$151,179,265	$158,754,265	$158,754,265	$158,754,265
Begining Loan Balance		$281,439,118	$299,114,118	$316,789,118	$334,464,118	$352,751,618	$370,426,618	$370,426,618
Debt Withdraw		$17,675,000	$17,675,000	$17,675,000	$18,287,500	$17,675,000	$0	$0
Ending Loan Balance		$299,114,118	$316,789,118	$334,464,118	$352,751,618	$370,426,618	$370,426,618	$370,426,618
Unused Loan Balance		$161,159,574	$143,484,574	$125,809,574	$107,522,074	$89,847,074	$89,847,074	$89,847,074
Commitment Fee	$4,084,700.17	$134,299.65	$119,570.48	$104,841.31	$89,601.73	$74,872.56	$74,872.56	$74,872.56
Arrangement Fee	$6,904,105.37							
Interest for the period	$66,817,076.47	$1,744,832.35	$1,786,338.64	$1,951,040.69	$1,989,127.18	$2,160,821.94	$2,160,821.94	$2,088,794.54
Total fees	$10,988,805.54	$134,299.65	$119,570.48	$104,841.31	$89,601.73	$74,872.56	$74,872.56	$74,872.56
Interest + Fees	$77,805,882.01	$1,879,132.00	$1,905,909.11	$2,055,882.00	$2,078,728.91	$2,235,694.50	$2,235,694.50	$2,163,667.10

Table 12.3: IDC + Fees Calculation (cont)

IDC & Fees Calculation		1-Oct-21 31-Oct-21	1-Nov-21 30-Nov-21	1-Dec-21 31-Dec-21	1-Jan-22 31-Jan-22	1-Feb-22 28-Feb-22	1-Mar-22 31-Mar-22	1-Apr-22 30-Apr-22
Beginning Equity		$158,754,265	$166,329,265	$166,329,265	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Equity withdrawal		$7,575,000	$0	$30,930,889	$0	$0	$0	$0
Ending Equity		$166,329,265	$166,329,265	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Begining Loan Balance		$370,426,618	$388,101,618	$388,101,618	$460,273,692	$460,273,692	$460,273,692	$460,273,692
Debt Withdraw		$17,675,000	$0	$72,172,074	$0	$0	$0	$0
Ending Loan Balance		$388,101,618	$388,101,618	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692
Unused Loan Balance		$72,172,074	$72,172,074	$0	$0	$0	$0	$0
Commitment Fee	$4,084,700.17	$60,143.40	$60,143.40	$0.00	$0.00	$0.00	$0.00	$0.00
Arrangement Fee	$6,904,105.37							
Interest for the period	$66,817,076.47	$2,263,926.10	$2,188,461.90	$2,684,929.87	$2,684,929.87	$2,416,436.88	$2,684,929.87	$2,595,432.21
Total fees	$10,988,805.54	$60,143.40	$60,143.40	$0.00	$0.00	$0.00	$0.00	$0.00
Interest + Fees	$77,805,882.01	$2,324,069.50	$2,248,605.29	$2,684,929.87	$2,684,929.87	$2,416,436.88	$2,684,929.87	$2,595,432.21

Table 12.4: IDC + Fees Calculation (cont)

IDC & Fees Calculation		1-May-22 31-May-22	1-Jun-22 30-Jun-22	1-Jul-22 31-Jul-22	1-Aug-22 31-Aug-22	1-Sep-22 30-Sep-22	1-Oct-22 31-Oct-22	1-Nov-22 30-Nov-22	1-Dec-22 31-Dec-22
Beginning Equity		$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Equity withdrawal		$0	$0	$0	$0	$0	$0	$0	$0
Ending Equity		$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Begining Loan Balance		$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692
Debt Withdraw		$0	$0	$0	$0	$0	$0	$0	$0
Ending Loan Balance		$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692	$460,273,692
Unused Loan Balance		$0	$0	$0	$0	$0	$0	$0	$0
Commitment Fee	$4,084,700.17	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Arrangement Fee	$6,904,105.37								
Interest for the period	$66,817,076.47	$2,684,929.87	$2,595,432.21	$2,684,929.87	$2,684,929.87	$2,595,432.21	$2,684,929.87	$2,595,432.21	$2,684,929.87
Total fees	$10,988,805.54	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Interest + Fees	$77,805,882.01	$2,684,929.87	$2,595,432.21	$2,684,929.87	$2,684,929.87	$2,595,432.21	$2,684,929.87	$2,595,432.21	$2,684,929.87

11.4. Sources & Uses

Sources

In this project there are two sources; Loan and Equity.

Loan is calculated monthly directly copied from CAPEX and the Equity is the same. Total sources is the sum of Loan + Equity.

Uses

CAPEX value which covers the values of EPC, Land, Development Fees, Owner's Engineer (construction phase), Development Cost, Insurance and Contingency is taken from CAPEX sheet (Total CAPEX). IDC + Fees, Working Capital and DSRA are also taken from CAPEX but they are shown separately because these values will be iterated.

Sources & Uses are shown as a table for the construction period (2020-2021).

Table 13: Sources & Uses

		1-Jan-20 31-Jan-20 2020	1-Feb-20 29-Feb-20 2020	1-Mar-20 31-Mar-20 2020	1-Apr-20 30-Apr-20 2020	1-May-20 31-May-20 2020
Sources						
Loan	$460,273,692	$104,076,618	$10,605,000	$10,605,000	$10,605,000	$10,605,000
Equity	$197,260,154	$44,604,265	$4,545,000	$4,545,000	$4,545,000	$4,545,000
Total	**$657,533,845**	**$148,680,882**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**
Uses						
Capex	$528,000,000	$70,875,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000
IDC &Fees	$77,805,882	$77,805,882	$0	$0	$0	$0
Working Capital	$10,464,426	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$148,680,882**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**

Table 13.1: Sources & Uses (cont)

		1-Jun-20 30-Jun-20 2020	1-Jul-20 31-Jul-20 2020	1-Aug-20 31-Aug-20 2020	1-Sep-20 30-Sep-20 2020	1-Oct-20 31-Oct-20 2020	1-Nov-20 30-Nov-20 2020	1-Dec-20 31-Dec-20 2020	1-Jan-21 31-Jan-21 2021
Sources									
Loan	$460,273,692	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$10,605,000	$43,032,500
Equity	$197,260,154	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$4,545,000	$18,442,500
Total	**$657,533,845**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$61,475,000**
Uses									
Capex	$528,000,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$15,150,000	$61,475,000
IDC &Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital	$10,464,426	$0	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$15,150,000**	**$61,475,000**

		1-Feb-21 28-Feb-21 2021	1-Mar-21 31-Mar-21 2021	1-Apr-21 30-Apr-21 2021	1-May-21 31-May-21 2021	1-Jun-21 30-Jun-21 2021	1-Jul-21 31-Jul-21 2021	1-Aug-21 31-Aug-21 2021	1-Sep-21 30-Sep-21 2021
Sources									
Loan	$460,273,692	$17,675,000	$17,675,000	$17,675,000	$17,675,000	$18,287,500	$17,675,000	$0	$0
Equity	$197,260,154	$7,575,000	$7,575,000	$7,575,000	$7,575,000	$7,837,500	$7,575,000	$0	$0
Total	**$657,533,845**	**$25,250,000**	**$25,250,000**	**$25,250,000**	**$25,250,000**	**$26,125,000**	**$25,250,000**	**$0**	**$0**
Uses									
Capex	$528,000,000	$25,250,000	$25,250,000	$25,250,000	$25,250,000	$26,125,000	$25,250,000	$0	$0
IDC &Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital	$10,464,426	$0	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$25,250,000**	**$25,250,000**	**$25,250,000**	**$25,250,000**	**$26,125,000**	**$25,250,000**	**$0**	**$0**

Table 13.2: Sources & Uses (cont)

		1-Oct-21 31-Oct-21 2021	1-Nov-21 30-Nov-21 2021	1-Dec-21 31-Dec-21 2021	1-Jan-22 31-Jan-22 2022	1-Feb-22 28-Feb-22 2022	1-Mar-22 31-Mar-22 2022	1-Apr-22 30-Apr-22 2022	1-May-22 31-May-22 2022
Sources									
Loan	$460,273,692	$17,675,000	$0	$72,172,074	$0	$0	$0	$0	$0
Equity	$197,260,154	$7,575,000	$0	$30,930,889	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$25,250,000**	**$0**	**$103,102,963**	**$0**	**$0**	**$0**	**$0**	**$0**
Uses									
Capex	$528,000,000	$25,250,000	$0	$51,375,000	$0	$0	$0	$0	$0
IDC &Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0	$0
Working Capital	$10,464,426	$0	$0	$10,464,426	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$41,263,537	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$25,250,000**	**$0**	**$103,102,963**	**$0**	**$0**	**$0**	**$0**	**$0**

		1-Jun-22 30-Jun-22 2022	1-Jul-22 31-Jul-22 2022	1-Aug-22 31-Aug-22 2022	1-Sep-22 30-Sep-22 2022	1-Oct-22 31-Oct-22 2022	1-Nov-22 30-Nov-22 2022	1-Dec-22 31-Dec-22 2022
Sources								
Loan	$460,273,692	$0	$0	$0	$0	$0	$0	$0
Equity	$197,260,154	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Uses								
Capex	$528,000,000	$0	$0	$0	$0	$0	$0	$0
IDC &Fees	$77,805,882	$0	$0	$0	$0	$0	$0	$0
Working Capital	$10,464,426	$0	$0	$0	$0	$0	$0	$0
DSRA	$41,263,537	$0	$0	$0	$0	$0	$0	$0
Total	**$657,533,845**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 14: Sources & Uses (net yearly calculation)

		2020	2021	2022
Sources				
Loan	$460,273,692	$220,731,618	$239,542,074	$0
Equity	$197,260,154	$94,599,265	$102,660,889	$0
Total	**$657,533,845**	**$315,330,882**	**$342,202,963**	**$0**
Uses				
Capex	$528,000,000	$237,525,000	$290,475,000	$0
IDC &Fees	$77,805,882	$77,805,882	$0	$0
Working Capital	$10,464,426	$0	$10,464,426	$0
DSRA	$41,263,537	$0	$41,263,537	$0
Total	**$657,533,845**	**$315,330,882**	**$342,202,963**	**$0**

11.5. Depreciation

Depreciation is calculated for the 20 years' operation period, over Total Capex – see Inputs.

Table 15: Depreciation

EPC	$505,000,000	
Plant & machinery	$425,000,000	
Pre-operative expense	$30,000,000	
Buildings	$50,000,000	
Land	$0	
Development Fees	$3,000,000	
Owner's Engineer (Cor	$3,500,000	
Legal Consultancy Fee	$1,000,000	
Development Costs	$5,000,000	
Insurance	$2,500,000	
Contingency	$8,000,000	
Working Capital Need	$10,464,426	Non Depreciable
IDC+ Fees	$77,805,882	
DSRA	$41,263,537	Non Depreciable
Total Capex	**$605,805,882**	

Table 15.1: Depreciation (cont)

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
	0	0	1	2	3	4	5	6	7	8
Depreciation			$30,290,294.11	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294

Year	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	9	10	11	12	13	14	15	16	17	18	19	20
Depreciation	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294	$30,290,294

11.6. Fixed Asset Roll Forward

Fixed Asset is the sum of Beginning PP&E (Plant, Property and Equipment) which is zero in the beginning, CAPEX and Depreciation. Ending PP&E for the current year equals to Beginning PP&E for the next year.

Note: Depreciation must be inserted as negative value in the table.

Table 16: Fixed Asset

Fixed Asset Roll Forward

	2020	2021	2022	2023	2024	2025	2026	2027
Beginning PP&E	$0	$315,330,882	$605,805,882	$575,515,588	$545,225,294	$514,935,000	$484,644,706	$454,354,412
Capex	$315,330,882	$290,475,000	$0	$0	$0	$0	$0	$0
-Depreciation	$0	$0	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
Ending PP&E	**$315,330,882**	**$605,805,882**	**$575,515,588**	**$545,225,294**	**$514,935,000**	**$484,644,706**	**$454,354,412**	**$424,064,118**

Fixed Asset Roll Forward

	2028	2029	2030	2031	2032	2033	2034	2035
Beginning PP&E	$424,064,118	$393,773,823	$363,483,529	$333,193,235	$302,902,941	$272,612,647	$242,322,353	$212,032,059
Capex	$0	$0	$0	$0	$0	$0	$0	$0
-Depreciation	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
Ending PP&E	**$393,773,823**	**$363,483,529**	**$333,193,235**	**$302,902,941**	**$272,612,647**	**$242,322,353**	**$212,032,059**	**$181,741,765**

Fixed Asset Roll Forward

	2036	2037	2038	2039	2040	2041
Beginning PP&E	$181,741,765	$151,451,471	$121,161,176	$90,870,882	$60,580,588	$30,290,294
Capex	$0	$0	$0	$0	$0	$0
-Depreciation	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
Ending PP&E	**$151,451,471**	**$121,161,176**	**$90,870,882**	**$60,580,588**	**$30,290,294**	**$0**

11.7. Loan

Loan payment are calculated per period (6 months) taking into account the payment percentage for period 6 months. Loan Start Balance equals to Loan Amount (unpaid) per period. Interest is calculated as Loan Amount x Interest Rate percentage - see Inputs. Principal Payment is calculated as Loan Amount x Payment. Total Payment is the sum of Interest and Principal Payment. Loan End Balance is calculated as Loan Start Balance minus Principal Payment.

Note: The Loan End Balance current year is the Loan Start Balance at next year. Also, Loan End Balance must be zero at the end of the last period.

Loan Start: 1-Jan-2020

Loan Amount: $460,273,692 (Total Debt Used)   **See Inputs**

Interest Rate: %7

Loan Tenor: 15 years

Table 17: Loan Calculation According to Each Period (6 Months)

		1	2	3	4	5	6
Period		1	2	3	4	5	6
Year		1	1	2	2	3	3
Payment %		1.00%	1.00%	1.00%	1.25%	1.25%	1.25%
Loan Start Balance		$460,273,692	$455,670,955	$451,068,218	$446,465,481	$440,712,060	$434,958,639
Interest	$286,992,154	$16,109,579	$15,948,483	$15,787,388	$15,626,292	$15,424,922	$15,223,552
Principal Payment	$460,273,692	$4,602,737	$4,602,737	$4,602,737	$5,753,421	$5,753,421	$5,753,421
Total Payment	$747,265,845	$20,712,316	$20,551,220	$20,390,125	$21,379,713	$21,178,343	$20,976,973
Loan End Balance		$455,670,955	$451,068,218	$446,465,481	$440,712,060	$434,958,639	$429,205,217

		7	8	9	10	11	12
Period		7	8	9	10	11	12
Year		4	4	5	5	6	6
Payment %		1.25%	4.00%	4.00%	4.00%	4.00%	4.00%
Loan Start Balance		$429,205,217	$423,451,796	$405,040,849	$386,629,901	$368,218,953	$349,808,006
Interest	$286,992,154	$15,022,183	$14,820,813	$14,176,430	$13,532,047	$12,887,663	$12,243,280
Principal Payment	$460,273,692	$5,753,421	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948
Total Payment	$747,265,845	$20,775,604	$33,231,761	$32,587,377	$31,942,994	$31,298,611	$30,654,228
Loan End Balance		$423,451,796	$405,040,849	$386,629,901	$368,218,953	$349,808,006	$331,397,058

		13	14	15	16	17	18
Period		13	14	15	16	17	18
Year		7	7	8	8	9	9
Payment %		4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Loan Start Balance		$331,397,058	$312,986,110	$294,575,163	$276,164,215	$257,753,267	$239,342,320
Interest	$286,992,154	$11,598,897	$10,954,514	$10,310,131	$9,665,748	$9,021,364	$8,376,981
Principal Payment	$460,273,692	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948
Total Payment	$747,265,845	$30,009,845	$29,365,462	$28,721,078	$28,076,695	$27,432,312	$26,787,929
Loan End Balance		$312,986,110	$294,575,163	$276,164,215	$257,753,267	$239,342,320	$220,931,372

		19	20	21	22	23	24	25	26
Period		19	20	21	22	23	24	25	26
Year		10	10	11	11	12	12	13	13
Payment %		4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Loan Start Balance		$220,931,372	$202,520,424	$184,109,477	$165,698,529	$147,287,581	$128,876,634	$110,465,686	$92,054,738
Interest	$286,992,154	$7,732,598	$7,088,215	$6,443,832	$5,799,449	$5,155,065	$4,510,682	$3,866,299	$3,221,916
Principal Payment	$460,273,692	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948	$18,410,948
Total Payment	$747,265,845	$26,143,546	$25,499,163	$24,854,779	$24,210,396	$23,566,013	$22,921,630	$22,277,247	$21,632,864
Loan End Balance		$202,520,424	$184,109,477	$165,698,529	$147,287,581	$128,876,634	$110,465,686	$92,054,738	$73,643,791

Table 17.1: Loan Calculation According to Each Period (6 Months) (cont)

		27	28	29	30
Period					
Year		14	14	15	15
Payment %		4.00%	4.00%	4.00%	4.00%
Loan Start Balance		$73,643,791	$55,232,843	$36,821,895	$18,410,948
Interest	$286,992,154	$2,577,533	$1,933,150	$1,288,766	$644,383
Principal Payment	$460,273,692	$18,410,948	$18,410,948	$18,410,948	$18,410,948
Total Payment	$747,265,845	$20,988,480	$20,344,097	$19,699,714	$19,055,331
Loan End Balance		$55,232,843	$36,821,895	$18,410,948	$0

After the consider of each period calculation, Loan is calculated for each year with "SUMIF" Excel formula for Interest and Principal Payment as mentioned below. Other calculations are same as shown above.

Table 18: Loan Calculation According to Each Year

Year		1 2022	2 2023	3 2024	4 2025	5 2026
Loan Start Balance		$460,273,692	$451,068,218	$440,712,060	$429,205,217	$405,040,849
Interest	$286,992,154	$32,058,063	$31,413,679	$30,648,474	$29,842,995	$27,708,476
Principal Payment	$460,273,692	$9,205,474	$10,356,158	$11,506,842	$24,164,369	$36,821,895
Total Payment	$747,265,845	$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372
Loan End Balance		$451,068,218	$440,712,060	$429,205,217	$405,040,849	$368,218,953

Year		6 2027	7 2028	8 2029	9 2030	10 2031
Loan Start Balance		$368,218,953	$331,397,058	$294,575,163	$257,753,267	$220,931,372
Interest	$286,992,154	$25,130,944	$22,553,411	$19,975,878	$17,398,346	$14,820,813
Principal Payment	$460,273,692	$36,821,895	$36,821,895	$36,821,895	$36,821,895	$36,821,895
Total Payment	$747,265,845	$61,952,839	$59,375,306	$56,797,774	$54,220,241	$51,642,708
Loan End Balance		$331,397,058	$294,575,163	$257,753,267	$220,931,372	$184,109,477

Year		11 2032	12 2033	13 2034	14 2035	15 2036
Loan Start Balance		$184,109,477	$147,287,581	$110,465,686	$73,643,791	$36,821,895
Interest	$286,992,154	$12,243,280	$9,665,748	$7,088,215	$4,510,682	$1,933,150
Principal Payment	$460,273,692	$36,821,895	$36,821,895	$36,821,895	$36,821,895	$36,821,895
Total Payment	$747,265,845	$49,065,176	$46,487,643	$43,910,110	$41,332,578	$38,755,045
Loan End Balance		$147,287,581	$110,465,686	$73,643,791	$36,821,895	$0

11.8. Debt Service Ratio Account (DSRA)

The Debt Service Ratio Account is a key component in almost every finance term sheet and financial model. The primary purpose of DSRA is to protect a lender against unexpected volatility or interruption in the Cash Flow Available to Debt Service (CFADS). These funds essentially put aside for a rainy day, are usually established at the end of a construction period, once the loan becomes repayable.

Annual Debt Service equals to Annual Loan Payments of which the sum of Principal Payment and Interest Payment for 15 years of repayment period is taken from Loan sheet. Due to 2020 and 2021 are construction period, Annnual Debt Service (ADS) starts from 2022.

Required Balance for 2021 equals to Annual Debt Service for next year. There is no withdrawal, so Ending Balance equals to Required Balance.

For the last tenor Required Balance must be zero. Therefore, Required Balance must be nullified in the year 2035.

Number of months to reserve: 12

Percentage (%) of Debt Service Ratio Account (DSRA): 100%

Note: Percentage of Debt Service Ratio Account calculation is Number of months to reserve over 12.

DSRA calculation is following below.

Table 19: DSRA Calculation

Year	0	1	2	3	4	5
	2021	2022	2023	2024	2025	2026
Annual Debt Service		$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372
Required Balance	$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372	$61,952,839
Withdrawals						
Ending Balance	$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372	$61,952,839

Year	6	7	8	9	10
	2027	2028	2029	2030	2031
Annual Debt Service	$61,952,839	$59,375,306	$56,797,774	$54,220,241	$51,642,708
Required Balance	$59,375,306	$56,797,774	$54,220,241	$51,642,708	$49,065,176
Withdrawals					
Ending Balance	$59,375,306	$56,797,774	$54,220,241	$51,642,708	$49,065,176

Year	10	11	12	13	14	15
	2031	2032	2033	2034	2035	2036
Annual Debt Service	$51,642,708	$49,065,176	$46,487,643	$43,910,110	$41,332,578	$38,755,045
Required Balance	$49,065,176	$46,487,643	$43,910,110	$41,332,578	$38,755,045	$0
Withdrawals					-$38,755,045	
Ending Balance	$49,065,176	$46,487,643	$43,910,110	$41,332,578	$0	$0

11.9. Income Statement

EBITDA: Earning Before Interest, Taxes, Depreciation and Amortisartion.

EBIT: Earnings Before Interest and Taxes.

EBT: Earnings Before Tax.

Calculation of Gross Profit

Revenues are taken from Operations (Nickes Sales). Variable O&M Expenses are taken from Operations but inserted into the table as negative values. Gross Profit is the sum of Revenue and Variable O&M Expenses. Gross Profit is 85% because it does not cover interest, taxes, depreciation and amortisation.

Calculation of EBITDA

Fixed Operation Expenses are taken from Operations but inserted into the table as negative values. EBITDA is the sum of Gross Profit and Fixed O&M Expenses values.

Calculation of EBIT

Depreciation is taken from Depreciation sheet but inserted into the table as negative values. EBIT is the sum of the EBITDA and Depreciation values.

Calculation of EBT

Interest is taken from Loan sheet (Yearly Calculation) but inserted into the table as negative values. EBT is the sum of EBIT and Interest.

Calculation of Net Income

Taxes calculated as EBT x Corporate Tax Rate (see Inputs) but inserted into the table as negative values. Net Income is the sum of EBT and Taxes. Each percentage (%) in the table are calculated over the Revenue.

Table 20: Income Statement

Year	2020	2021	2022	2023	2024	2025	2026
Income Statement							
Revenue	$0	$0	$1,359,897,000	$1,380,295,455	$1,400,999,887	$1,422,014,885	$1,443,345,108
Variable O&M Expenses	$0	$0	-$199,451,560	-$202,443,333	-$205,479,983	-$208,562,183	-$211,690,616
Gross Profit	$0	$0	$1,160,445,440	$1,177,852,122	$1,195,519,903	$1,213,452,702	$1,231,654,493
%	0%	0%	85%	85%	85%	85%	85%
Fixed O&M Expenses	$0	$0	-$982,834,650	-$997,577,170	-$1,012,540,827	-$1,027,728,940	-$1,043,144,874
EBITDA	$0	$0	$177,610,790	$180,274,952	$182,979,076	$185,723,762	$188,509,619
%	0%	0%	13%	13%	13%	13%	13%
Depreciation	$0	$0	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
EBIT	$0	$0	$147,320,496	$149,984,658	$152,688,782	$155,433,468	$158,219,325
%	0%	0%	11%	11%	11%	11%	11%
Interest	$0	$0	-$32,058,063	-$31,413,679	-$30,648,474	-$29,842,995	-$27,708,476
EBT	$0	$0	$115,262,433	$118,570,978	$122,040,308	$125,590,473	$130,510,848
%	0%	0%	8%	9%	9%	9%	9%
Taxes	$0	$0	-$23,052,487	-$23,714,196	-$24,408,062	-$25,118,095	-$26,102,170
Net Income	$0	$0	$92,209,947	$94,856,783	$97,632,246	$100,472,378	$104,408,679
%	0%	0%	7%	7%	7%	7%	7%

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Table 20.1: Income Statement (cont)

Year	2027	2028	2029	2030	2031	2032	2033
Income Statement							
Revenue	$1,464,995,285	$1,486,970,214	$1,509,274,768	$1,531,913,889	$1,554,892,597	$1,578,215,986	$1,601,889,226
Variable O&M Expenses	-$214,865,975	-$218,088,965	-$221,360,299	-$224,680,704	-$228,050,914	-$231,471,678	-$234,943,753
Gross Profit	**$1,250,129,310**	**$1,268,881,250**	**$1,287,914,468**	**$1,307,233,185**	**$1,326,841,683**	**$1,346,744,308**	**$1,366,945,473**
%	85%	85%	85%	85%	85%	85%	85%
Fixed O&M Expenses	-$1,058,792,047	-$1,074,673,928	-$1,090,794,037	-$1,107,155,947	-$1,123,763,286	-$1,140,619,736	-$1,157,729,032
EBITDA	**$191,337,263**	**$194,207,322**	**$197,120,432**	**$200,077,238**	**$203,078,397**	**$206,124,573**	**$209,216,441**
%	13%	13%	13%	13%	13%	13%	13%
Depreciation	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
EBIT	**$161,046,969**	**$163,917,028**	**$166,830,138**	**$169,786,944**	**$172,788,103**	**$175,834,279**	**$178,926,147**
%	11%	11%	11%	11%	11%	11%	11%
Interest	-$25,130,944	-$22,553,411	-$19,975,878	-$17,398,346	-$14,820,813	-$12,243,280	-$9,665,748
EBT	**$135,916,025**	**$141,363,617**	**$146,854,259**	**$152,388,599**	**$157,967,290**	**$163,590,998**	**$169,260,400**
%	9%	10%	10%	10%	10%	10%	11%
Taxes	-$27,183,205	-$28,272,723	-$29,370,852	-$30,477,720	-$31,593,458	-$32,718,200	-$33,852,080
Net Income	**$108,732,820**	**$113,090,894**	**$117,483,408**	**$121,910,879**	**$126,373,832**	**$130,872,799**	**$135,408,320**
%	7%	8%	8%	8%	8%	8%	8%

Table 20.2: Income Statement (cont)

Year	2034	2035	2036	2037	2038	2039	2040	2041
Income Statement								
Revenue	$1,625,917,565	$1,650,306,328	$1,675,060,923	$1,700,186,837	$1,725,689,639	$1,751,574,984	$1,777,848,609	$1,804,516,338
Variable O&M Expenses	-$238,467,909	-$242,044,928	-$245,675,602	-$249,360,736	-$253,101,147	-$256,897,664	-$260,751,129	-$264,662,396
Gross Profit	**$1,387,449,655**	**$1,408,261,400**	**$1,429,385,321**	**$1,450,826,101**	**$1,472,588,492**	**$1,494,677,320**	**$1,517,097,479**	**$1,539,853,942**
%	85%	85%	85%	85%	85%	85%	85%	85%
Fixed O&M Expenses	-$1,175,094,967	-$1,192,721,392	-$1,210,612,212	-$1,228,771,396	-$1,247,202,967	-$1,265,911,011	-$1,284,899,676	-$1,304,173,171
EBITDA	**$212,354,688**	**$215,540,008**	**$218,773,108**	**$222,054,705**	**$225,385,526**	**$228,766,309**	**$232,197,803**	**$235,680,770**
%	13%	13%	13%	13%	13%	13%	13%	13%
Depreciation	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294	-$30,290,294
EBIT	**$182,064,394**	**$185,249,714**	**$188,482,814**	**$191,764,411**	**$195,095,232**	**$198,476,014**	**$201,907,509**	**$205,390,476**
%	11%	11%	11%	11%	11%	11%	11%	11%
Interest	-$7,088,215	-$4,510,682	-$1,933,150	$0	$0	$0	$0	$0
EBT	**$174,976,179**	**$180,739,032**	**$186,549,665**	**$191,764,411**	**$195,095,232**	**$198,476,014**	**$201,907,509**	**$205,390,476**
%	11%	11%	11%	11%	11%	11%	11%	11%
Taxes	-$34,995,236	-$36,147,806	-$37,309,933	-$38,352,882	-$39,019,046	-$39,695,203	-$40,381,502	-$41,078,095
Net Income	**$139,980,943**	**$144,591,226**	**$149,239,732**	**$153,411,529**	**$156,076,185**	**$158,780,812**	**$161,526,007**	**$164,312,381**
%	9%	9%	9%	9%	9%	9%	9%	9%

11.10. Balance Sheet

<u>Calculation of Assets</u>

Cash is taken from Cash Flow.

Restricted Cash is taken from DSRA – Ending Balance in 2021.

Due to 2020 and 2021 is construction period, no any accounts receivable values for these years. But in the following years it is calculated as Income Statement values for each year x daily calculation of receivable value (see Inputs) / 365. Over 365 meaning, the calculation is converted from monthly to daily.

Inventory values taken from Inputs but escalated by inflation rate (1.5%)- see Inputs.

Current Assets is the sum of Assets includes Cash, Restricted Cash, Accounts Receivable and Inventory.

Fixed Assets equals to Ending PP&E values which are taken from Fixed Assets sheet.

Non-Current Assets equals to Fixed Assets but should be zero in the year 2041.

Total Assets is the sum of Current Assets and Non-Current Assets.

<u>Calculation of Liabilities</u>

There is no Accounts Payable in 2020 and 2021 due to these years are construction period. For the following years (2022-2041), Accounts Payable accounting values are taken as the sum of Variable and Fixed Expenses from Income Statement and this total multiplies with daily calculation of payable value (see Inputs) /365. Over 365 meaning, the calculation is converted from monthly to daily. This calculation should be negative in the table because these receivables not incurred as a cost.

Debt for 2020 and 2021 are taken from Sources-Uses because of the loan payments have not started yet, however debt from year 2022 to 2041 are taken from the loan payments due to during operation period (2020-2041) loan payment is made.

Total Liabilities is the sum of Accounts Payable and Debt values.

Calculation of Equity

For the first year (2020) Paid in Capital value is taken from Sources-Uses sheet. Following for the next two years these values are again taken from Sources-Uses according to years but the value of each year is calculated by adding to the value of the previous year. Until 2041, all the Paid in Capital values equal to the 2022 amount.

As seen in the cash flow, all net incomes are dividend paid. Therefore, the Retained Earnings are zero.

Note: Retained Earnings values are found after the calculation of Ending Balance values in Cash Flow Sheet.

Total Equity is the sum of Paid in Capital and Retained Earnings values.

Total Liabilities + Equity is the sum of Total Liabilities and Total Equity values.

Table 21: Balance Sheet

Year	2020	2021	2022	2023	2024	2025	2026	2027
Assets								
Cash	$0	$5,464,426	$59,956,903	$79,939,269	$87,310,888	$83,360,625	$79,860,077	$76,366,331
Restricted Cash	$0	$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372	$61,952,839	$59,375,306
Accounts Receivable	$0	$0	$111,772,356	$113,448,942	$115,150,676	$116,877,936	$118,631,105	$120,410,571
Inventory	$0	$5,000,000	$5,075,000	$5,151,125	$5,228,392	$5,306,818	$5,386,420	$5,467,216
Current Assets	**$0**	**$51,727,963**	**$218,574,097**	**$240,694,652**	**$261,697,320**	**$270,075,750**	**$265,830,440**	**$261,619,425**
Fixed Assets	$315,330,882	$605,805,882	$575,515,588	$545,225,294	$514,935,000	$484,644,706	$454,354,412	$424,064,118
Non-current Assets	**$315,330,882**	**$605,805,882**	**$575,515,588**	**$545,225,294**	**$514,935,000**	**$484,644,706**	**$454,354,412**	**$424,064,118**
Total Asets	**$315,330,882**	**$657,533,845**	**$794,089,685**	**$785,919,946**	**$776,632,320**	**$754,720,456**	**$720,184,852**	**$685,683,543**
Liabilities								
Accounts Payable	$0	$0	$145,761,314	$147,947,733	$150,166,949	$152,419,454	$154,705,745	$157,026,331
Debt	$220,731,618	$460,273,692	$451,068,218	$440,712,060	$429,205,217	$405,040,849	$368,218,953	$331,397,058
Total Liabilities	**$220,731,618**	**$460,273,692**	**$596,829,531**	**$588,659,793**	**$579,372,167**	**$557,460,302**	**$522,924,699**	**$488,423,389**
Equity								
Paid in Capital	$94,599,265	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Retained Earnings	$0	$0	$0	$0	$0	$0	$0	$0
Total Equity	**$94,599,265**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**
Total Liabilities + Equity	**$315,330,882**	**$657,533,845**	**$794,089,685**	**$785,919,946**	**$776,632,320**	**$754,720,456**	**$720,184,852**	**$685,683,543**

Table 21.1: Balance Sheet (cont)

Year	2028	2029	2030	2031	2032	2033	2034	2035
Assets								
Cash	$72,879,491	$69,399,659	$65,926,941	$62,461,443	$59,003,273	$55,552,542	$52,109,361	$87,428,888
Restricted Cash	$56,797,774	$54,220,241	$51,642,708	$49,065,176	$46,487,643	$43,910,110	$41,332,578	$0
Accounts Receivable	$122,216,730	$124,049,981	$125,910,731	$127,799,392	$129,716,382	$131,662,128	$133,637,060	$135,641,616
Inventory	$5,549,225	$5,632,463	$5,716,950	$5,802,704	$5,889,745	$5,978,091	$6,067,762	$6,158,779
Current Assets	**$257,443,219**	**$253,302,344**	**$249,197,329**	**$245,128,714**	**$241,097,043**	**$237,102,871**	**$233,146,761**	**$229,229,283**
Fixed Assets	$393,773,823	$363,483,529	$333,193,235	$302,902,941	$272,612,647	$242,322,353	$212,032,059	$181,741,765
Non-current Assets	**$393,773,823**	**$363,483,529**	**$333,193,235**	**$302,902,941**	**$272,612,647**	**$242,322,353**	**$212,032,059**	**$181,741,765**
Total Asets	**$651,217,043**	**$616,785,873**	**$582,390,565**	**$548,031,655**	**$513,709,690**	**$479,425,224**	**$445,178,819**	**$410,971,047**
Liabilities								
Accounts Payable	$159,381,726	$161,772,452	$164,199,039	$166,662,025	$169,161,955	$171,699,384	$174,274,875	$176,888,998
Debt	$294,575,163	$257,753,267	$220,931,372	$184,109,477	$147,287,581	$110,465,686	$73,643,791	$36,821,895
Total Liabilities	**$453,956,889**	**$419,525,720**	**$385,130,411**	**$350,771,501**	**$316,449,536**	**$282,165,070**	**$247,918,666**	**$213,710,894**
Equity								
Paid in Capital	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Retained Earnings	$0	$0	$0	$0	$0	$0	$0	$0
Total Equity	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**
Total Liabilities + Equity	**$651,217,043**	**$616,785,873**	**$582,390,565**	**$548,031,655**	**$513,709,690**	**$479,425,224**	**$445,178,819**	**$410,971,047**

Table 21.2: Balance Sheet (cont)

Year	2036	2037	2038	2039	2040	2041
Assets						
Cash	$81,423,616	$112,248,134	$143,080,665	$173,921,330	$204,770,251	$235,627,551
Restricted Cash	$0	$0	$0	$0	$0	$0
Accounts Receivable	$137,676,240	$139,741,384	$141,837,505	$143,965,067	$146,124,543	$148,316,411
Inventory	$6,251,160	$6,344,928	$6,440,102	$6,536,703	$6,634,754	$6,734,275
Current Assets	**$225,351,016**	**$258,334,445**	**$291,358,272**	**$324,423,101**	**$357,529,548**	**$390,678,237**
Fixed Assets	$151,451,471	$121,161,176	$90,870,882	$60,580,588	$30,290,294	$0
Non-current Assets	**$151,451,471**	**$121,161,176**	**$90,870,882**	**$60,580,588**	**$30,290,294**	**$0**
Total Asets	**$376,802,487**	**$379,495,622**	**$382,229,154**	**$385,003,689**	**$387,819,842**	**$390,678,237**
Liabilities						
Accounts Payable	$179,542,333	$182,235,468	$184,969,000	$187,743,535	$190,559,688	$193,418,084
Debt	$0	$0	$0	$0	$0	$0
Total Liabilities	**$179,542,333**	**$182,235,468**	**$184,969,000**	**$187,743,535**	**$190,559,688**	**$193,418,084**
Equity						
Paid in Capital	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154	$197,260,154
Retained Earnings	$0	$0	$0	$0	$0	$0
Total Equity	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**	**$197,260,154**
Total Liabilities + Equity	**$376,802,487**	**$379,495,622**	**$382,229,154**	**$385,003,689**	**$387,819,842**	**$390,678,237**

11.11. Cash Flow

Calculation of Cash from Operations

EBITDA and Tax values are taken from Income Statement sheet for each year.

For the calculation of Changes in Accounts; Restricted Cash, Accounts Receivable, Inventory and Accounts Payable values are taken from Balance Sheet. This calculation is made by subtracting the value of previous year from each year and all values are inserted into table as negative values.

Total Cash from Operations are calculated by collecting from EBITDA to Accounts Payable.

Calculation of Cash from Financing

Loan Used, Equity Paid and IDC + Fees values are taken from Sources-Uses but IDC + Fees values are inserted into table as negative values.

Principal Payment and Interest Payment are taken from Loan sheet but inserted as negative values.

Note: Loan Used, Equity Paid and IDC + Fees begin from 2020 due to construction period starts since 2020 but Principal Payments and Interest Payments begin from 2022 because payments are made in operation period.

Total Cash from Financing is calculated by collecting from Loan Used to Interest Payment.

Calculation of Cash from Investing

CAPEX is taken from Sources-Uses sheet but inserted into table negatively.

Total Cash from Investing equals to CAPEX values. Net Cash Flow is the sum of Total Cash from Operations, Total Cash from Financing and Total Cash from Investing.

Table 22: Cash Flow

Year	2020	2021	2022	2023	2024	2025	2026	2027
Cash From Operations								
EBITDA	$0	$0	$177,610,790	$180,274,952	$182,979,076	$185,723,762	$188,509,619	$191,337,263
Tax	$0	$0	-$23,052,487	-$23,714,196	-$24,408,062	-$25,118,095	-$26,102,170	-$27,183,205
Changes in Accounts								
Restricted cash	$0	-$41,263,536	-$506,301	-$385,479	-$11,852,048	-$10,523,007	$2,577,533	$2,577,533
Accounts Receivable	$0	$0	-$111,772,356	-$1,676,585	-$1,701,734	-$1,727,260	-$1,753,169	-$1,779,467
Inventory	$0	-$5,000,000	-$75,000	-$76,125	-$77,267	-$78,426	-$79,602	-$80,796
Accounts Payable	$0	$0	$145,761,314	$2,186,420	$2,219,216	$2,252,504	$2,286,292	$2,320,586
Total Cash from Operations	$0	-$46,263,536	$187,965,960	$156,608,986	$147,159,182	$150,529,479	$165,438,502	$167,191,914
Cash From Financing								
Loan Used	$220,731,618	$239,542,074	$0	$0				
Equity Paid	$94,599,265	$102,660,889	$0	$0				
IDC + Fees	-$77,805,882	$0	$0	$0				
Principal Payment			-$9,205,474	-$10,356,158	-$11,506,842	-$24,164,369	-$36,821,895	-$36,821,895
Interest Payment			-$32,058,063	-$31,413,679	-$30,648,474	-$29,842,995	-$27,708,476	-$25,130,944
Total Cash From Financing	$237,525,000	$342,202,963	-$41,263,536	-$41,769,838	-$42,155,317	-$54,007,364	-$64,530,372	-$61,952,839
Cash From Investing								
Capex	-$237,525,000	-$290,475,000	$0	$0				
Total Cash From Investing	-$237,525,000	-$290,475,000	$0	$0	$0	$0	$0	$0
Net Cash Flow	$0	$5,464,426	$146,702,423	$114,839,149	$105,003,865	$96,522,114	$100,908,131	$105,239,075

Table 22.1: Cash Flow (cont)

Year	2028	2029	2030	2031	2032	2033	2034	2035
Cash From Operations								
EBITDA	$194,207,322	$197,120,432	$200,077,238	$203,078,397	$206,124,573	$209,216,441	$212,354,688	$215,540,008
Tax	-$28,272,723	-$29,370,852	-$30,477,720	-$31,593,458	-$32,718,200	-$33,852,080	-$34,995,236	-$36,147,806
Changes in Accounts								
Restricted cash	$2,577,533	$2,577,533	$2,577,533	$2,577,533	$2,577,533	$2,577,533	$2,577,533	$41,332,578
Accounts Receivable	-$1,806,159	-$1,833,251	-$1,860,750	-$1,888,661	-$1,916,991	-$1,945,746	-$1,974,932	-$2,004,556
Inventory	-$82,008	-$83,238	-$84,487	-$85,754	-$87,041	-$88,346	-$89,671	-$91,016
Accounts Payable	$2,355,395	$2,390,726	$2,426,587	$2,462,986	$2,499,930	$2,537,429	$2,575,491	$2,614,123
Total Cash from Operations	**$168,979,359**	**$170,801,349**	**$172,658,401**	**$174,551,042**	**$176,479,805**	**$178,445,232**	**$180,447,872**	**$221,243,330**
Cash From Financing								
Loan Used								
Equity Paid								
IDC + Fees								
Principal Payment	-$36,821,895	-$36,821,895	-$36,821,895	-$36,821,895	-$36,821,895	-$36,821,895	-$36,821,895	-$36,821,895
Interest Payment	-$22,553,411	-$19,975,878	-$17,398,346	-$14,820,813	-$12,243,280	-$9,665,748	-$7,088,215	-$4,510,682
Total Cash From Financing	**-$59,375,306**	**-$56,797,774**	**-$54,220,241**	**-$51,642,708**	**-$49,065,176**	**-$46,487,643**	**-$43,910,110**	**-$41,332,578**
Cash From Investing								
Capex								
Total Cash From Investing	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Net Cash Flow	**$109,604,053**	**$114,003,576**	**$118,438,160**	**$122,908,334**	**$127,414,629**	**$131,957,589**	**$136,537,762**	**$179,910,753**

Table 22.2: Cash Flow (cont)

Year	2036	2037	2038	2039	2040	2041
Cash From Operations						
EBITDA	$218,773,108	$222,054,705	$225,385,526	$228,766,309	$232,197,803	$235,680,770
Tax	-$37,309,933	-$38,352,882	-$39,019,046	-$39,695,203	-$40,381,502	-$41,078,095
Changes in Accounts						
Restricted cash	$0	$0	$0	$0	$0	$0
Accounts Receivable	-$2,034,624	-$2,065,144	-$2,096,121	-$2,127,563	-$2,159,476	-$2,191,868
Inventory	-$92,382	-$93,767	-$95,174	-$96,602	-$98,051	-$99,521
Accounts Payable	$2,653,335	$2,693,135	$2,733,532	$2,774,535	$2,816,153	$2,858,395
Total Cash from Operations	**$181,989,505**	**$184,236,047**	**$186,908,717**	**$189,621,477**	**$192,374,928**	**$195,169,681**
Cash From Financing						
Loan Used						
Equity Paid						
IDC + Fees						
Principal Payment	-$36,821,895	$0	$0	$0	$0	$0
Interest Payment	-$1,933,150	$0	$0	$0	$0	$0
Total Cash From Financing	**-$38,755,045**	**$0**	**$0**	**$0**	**$0**	**$0**
Cash From Investing						
Capex						
Total Cash From Investing	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Net Cash Flow	**$143,234,460**	**$184,236,047**	**$186,908,717**	**$189,621,477**	**$192,374,928**	**$195,169,681**

Retained Earnings Calculation

Retained Earnings (RE) is the amount of net income left over for the business after it has been paid out to dividends. A business generates earnings that can be positive (profits) or negative (losses). The Retained Earnings formula is;

RE=Beginning Period RE + Net Income (or Loss) + (– Cash Dividends) + (– Stock Dividends).

In the table, the Ending Balance of each previous year equals to Beginning Balance of each next year. In this model Net Income and Dividens Paid is same and due to Dividends Paid is made from Net Income, the Retained Earnigns is zero at the end of the operation period.

Ending Balance is the sum of the Beginning Balance and Dividends Paid.

Note: When Dividends Paid is calculated, Net Income value for each year (taken from Income Statement sheet) is multiplied by Dividend Distribution Allowance (see Inputs). Dividends Paid must be inserted into table negatively.

Cash Account Calculation

Because of the 2020 is construction period, Beginning Cash is zero. Net Cash Flow and Dividends Paid equal to above Net Cash Flow and Dividends Paid amounts.

Ending Balance is sum of the Beginning Cash, Net Cash Flow and Dividends Paid.

In 2022, Beginning Cash equals to Ending Balance of 2020 and for all the next calculations of Cash Account; Beginning Balance of each year will be equal to the Ending Balance of previous year.

Table 23: Retained Earnings & Cash Account Calculation

Year	2020	2021	2022	2023	2024	2025	2026	2027
Retained earnings								
Beginning Balance	$0	$0	$0	$0	$0	$0	$0	$0
Net Income	$0	$0	$92,209,947	$94,856,783	$97,632,246	$100,472,378	$104,408,679	$108,732,820
Dividends paid	$0	$0	-$92,209,947	-$94,856,783	-$97,632,246	-$100,472,378	-$104,408,679	-$108,732,820
Ending Balance	$0	$0	$0	$0	$0	$0	$0	$0
Retained Earnings for the Period	$0	$0	$0	$0	$0	$0	$0	$0
Cash Account								
Beginning Cash	$0	$0	$5,464,426	$59,956,903	$79,939,269	$87,310,888	$83,360,625	$79,860,077
Net Cash Flow	$0	$5,464,426	$146,702,423	$114,839,149	$105,003,865	$96,522,114	$100,908,131	$105,239,075
Dividends paid	0	$0	-$92,209,947	-$94,856,783	-$97,632,246	-$100,472,378	-$104,408,679	-$108,732,820
Ending Balance	$0	$5,464,426	$59,956,903	$79,939,269	$87,310,888	$83,360,625	$79,860,077	$76,366,331

Year	2028	2029	2030	2031	2032	2033	2034	2035
Retained earnings	$0	$0	$0	$0	$0	$0	$0	$0
Beginning Balance	$113,090,894	$117,483,408	$121,910,879	$126,373,832	$130,872,799	$135,408,320	$139,980,943	$144,591,226
Net Income	-$113,090,894	-$117,483,408	-$121,910,879	-$126,373,832	-$130,872,799	-$135,408,320	-$139,980,943	-$144,591,226
Dividends paid	$0	$0	$0	$0	$0	$0	$0	$0
Ending Balance								
	$0	$0	$0	$0	$0	$0	$0	$0
Retained Earnings for the Period								
Cash Account	$76,366,331	$72,879,491	$69,399,659	$65,926,941	$62,461,443	$59,003,273	$55,552,542	$52,109,361
Beginning Cash	$109,604,053	$114,003,576	$118,438,160	$122,908,334	$127,414,629	$131,957,589	$136,537,762	$179,910,753
Net Cash Flow	-$113,090,894	-$117,483,408	-$121,910,879	-$126,373,832	-$130,872,799	-$135,408,320	-$139,980,943	-$144,591,226
Dividends paid	$72,879,491	$69,399,659	$65,926,941	$62,461,443	$59,003,273	$55,552,542	$52,109,361	$87,428,888
Ending Balance								

Table 23.1: Retained Earnings & Cash Account Calculation (cont)

Year	2036	2037	2038	2039	2040	2041
Retained earnings						
Beginning Balance	$0	$0	$0	$0	$0	$0
Net Income	$149,239,732	$153,411,529	$156,076,185	$158,780,812	$161,526,007	$164,312,381
Dividends paid	-$149,239,732	-$153,411,529	-$156,076,185	-$158,780,812	-$161,526,007	-$164,312,381
Ending Balance	$0	$0	$0	$0	$0	$0
Retained Earnings for the Period	$0	$0	$0	$0	$0	$0
Cash Account						
Beginning Cash	$87,428,888	$81,423,616	$112,248,134	$143,080,665	$173,921,330	$204,770,251
Net Cash Flow	$143,234,460	$184,236,047	$186,908,717	$189,621,477	$192,374,928	$195,169,681
Dividends paid	-$149,239,732	-$153,411,529	-$156,076,185	-$158,780,812	-$161,526,007	-$164,312,381
Ending Balance	$81,423,616	$112,248,134	$143,080,665	$173,921,330	$204,770,251	$235,627,551

11.12.   Sensitivity

Debt Service Coverage Ratio (DSCR) Calculation

In this process the companys' debt payment capacity is checked. For this, Cash Available for Debt Service values are taken from Cash Flow sheet and Debt Service values which are Total Payment on Loan sheet are inserted into table for each year and after Debt Service Coverage Ratio is calculated. (Cash Available for Debt Service / Debt Service). At the end of the calculation, DSCR Average and DSCR Minimum values will be evaluated. The lower limit of average and minimum debt service cover ratio values vary from bank to bank according to the company's financial status.

In this model, the lower limit of average debt repayment capacity is determined as 3 by the bank and the lower limit of minimum debt repayment capacity is determined as 2. As shown below, the results that are calculated for average and minimum DSCR are higher than the determined limits. So, we can say that this firm has the capacity to pay its debts without any difficulty for each next month and it has money in hand.

Table 24: Sensitivity – DSCR Calculation

Year		2020	2021	2022	2023	2024	2025	2026	2027
DSCR Calculation									
Cash available for debt service		$0	-$46,263,536	$187,965,960	$156,608,986	$147,159,182	$150,529,479	$165,438,502	$167,191,914
Debt Service				$41,263,536	$41,769,838	$42,155,317	$54,007,364	$64,530,372	$61,952,839
DSCR				4.56	3.75	3.49	2.79	2.56	2.70
DSCR Average	3.59								
DSCR Minimum	2.56								

Year	2028	2029	2030	2031	2032	2033	2034	2035
DSCR Calculation								
Cash available for debt service	$168,979,359	$170,801,349	$172,658,401	$174,551,042	$176,479,805	$178,445,232	$180,447,872	$221,243,330
Debt Service	$59,375,306	$56,797,774	$54,220,241	$51,642,708	$49,065,176	$46,487,643	$43,910,110	$41,332,578
DSCR	2.85	3.01	3.18	3.38	3.60	3.84	4.11	5.35

Year	2036	2037	2038	2039	2040	2041
DSCR Calculation						
Cash available for debt service	$181,989,505	$184,236,047	$186,908,717	$189,621,477	$192,374,928	$195,169,681
Debt Service	$38,755,045	$0	$0	$0	$0	$0
DSCR	4.70					

<u>Internal Rate of Return (IRR) Calculation</u>

<u>Equity & Project Cash Flow</u>

Internal rate of return (IRR) is a rate of return which makes the net present value of all the cash flows (both negative or positive) from a project or investment equal to zero. It uses for the measure and evaluate of projects' feasibility. At the end of this evaluation, it is decided to whether or not to invest in project. If the IRR below the rate of return the project should be rejected. On the other hand, if the project IRR exceeds a firms' required rate of return, it can be said that the project is feasible.

In the calculation of Project Internal Rate of Return, the purpose is to see cash flows from the project only (except financing cost). Project IRR is calculated by assuming there is no debt amount in project financing. And also, Project IRR does not consider the capital mix of project. It is only about the cash flows from the project. In spite of this, Equity Internal Rate of Return is calculated only cash flow for the equity shareholders. By means of the Equity IRR, the rate of return can be given that earned by the equity shareholder on the money invested by them. Equity IRR consists of both debt and equity amount. Besides, if the project is completely financed with equity, the Project and Equity IRR will be the same but if the project entirely financed with debt, Equity IRR will not exist.

Discount Factor is a decimal term that multiplies the future income and losses and it represents the multiplier of the currency to determine the net present value of an investment. In other words, discount factor is used to find the Net Present Value (NPV) which is used for calculation of expected profit & loss based on future payments.

WACC (Weighted Average Cost of Capital) shows in percents how much it costs for a company to borrow money or bonds from banks, shareholders, lenders or bondholders Briefly, WACC shows weigted borrowing ratio of firm into the model. Usually, Weighted Average Cost of Capital rate is decided between banks and project owner. The weighted average cost of capital varies according to each firms' agreement with the bank. Generally, this rate is approximately taken as 9%, but in this model it is assumed to be as 9.5%.

Payback shows the starting year of the repayment of the investment year.

Net present value is downloading of future earnings with a certain interest or discount rate to starting year.

The details of equity and project cash flow calculations are mentioned below.

Equity Paid values are taken from Sources Uses sheet but inserted into table as negatively because these are paid out.

Dividend Received are also inserted negatively into the table and these values are taken from Cash Flow sheet. Dividend Received shows the money received by shareholders.

Net Equity Cash Flow is the sum of the Equity Paid and Dividend Received. It shows the money in account for each year. After net cash flow calculation, cumulative cash flow is calculated by adding money from previous year to the cash flow within each year. In this calculation; the first year (2020) Cumulative amount equals to first year (2020) Net value, but Cumulative amount for 2021 is the sum of the first year (2020) Cumulative amount and the second year (2021) Net amount. So, the money amount which accumulated from each year can be seen at the end of the period (2041).

Discount Factor is a percentage that represents the time value of money for a certain cash flow. Discount Factor formula for the future is $1/(1+ WACC)^n$. "n" means years which indicates how many years you will receive the cash flow in the future.

Discount Cash Flow (DCF) is a method that analyses of the value of project or asset using in the time value of money. It is calculated by the multiplying Net amount with Discount Factor.

Net Present Value (NPV) is the sum of the Discount Cash Flow from 2020 to 2041.

Payback is made into the table with "COUNTIF" Excel formula. It shows values lower than zero which means the starting year of the repayment of the

investment year mentioned above. The repayment for the cumulative of equity cash flow starts after 2023 in the table.

The percentage of IRR (Internal Rate of Return) has been calculated with excel formula but it can be calculated with formula as in the following;

$$0 = CF1 / (1 + IRR) + CF_2 / (1 + IRR)^2 + CF_3 / (1 + IRR)^3 + \ldots + CF_n / (1 + IRR)^n$$

Where:

$CF_0 =$ Initial Investment

CF_1 , CF_2 , CF_3 … $CF_n =$ Cash Flows

NPV $=$ Net Present Value

IRR $=$ Internal Rate of Return

n $=$ Each Period

Table 25: IRR Calculation- Equity Cash Flow

		2020	2021	2022	2023	2024	2025	2026
		0	1	2	3	4	5	6
Equity Cash Flow								
Equity Paid		-$94,599,265	-$102,660,889	$0	$0			
Dividend Received		$0	$0	$92,209,947	$94,856,783	$97,632,246	$100,472,378	$104,408,679
Net		**-$94,599,265**	**-$102,660,889**	**$92,209,947**	**$94,856,783**	**$97,632,246**	**$100,472,378**	**$104,408,679**
Cumulative		**-$94,599,265**	**-$197,260,154**	**-$105,050,207**	**-$10,193,424**	**$87,438,822**	**$187,911,200**	**$292,319,879**
Discount Factor		**1.00**	**0.91**	**0.83**	**0.76**	**0.70**	**0.64**	**0.58**
DCF		-$94,599,264.67	-$93,754,236.40	$76,904,106.77	$72,248,033.82	$67,910,480.58	$63,822,834.19	$60,569,206.57

		2027	2028	2029	2030	2031	2032	2033
IRR	**42%**	7	8	9	10	11	12	13
WACC	9.50%	$108,732,820	$113,090,894	$117,483,408	$121,910,879	$126,373,832	$130,872,799	$135,408,320
NPV	**$752,348,860.34**	**$108,732,820**	**$113,090,894**	**$117,483,408**	**$121,910,879**	**$126,373,832**	**$130,872,799**	**$135,408,320**
		$401,052,699	**$514,143,592**	**$631,627,000**	**$753,537,879**	**$879,911,711**	**$1,010,784,509**	**$1,146,192,829**
Payback	**4**	**0.53**	**0.48**	**0.44**	**0.40**	**0.37**	**0.34**	**0.31**
		$57,605,217.19	$54,716,042.99	$51,909,812.71	$49,192,769.14	$46,569,528.76	$44,043,310.99	$41,616,140.38

	2034	2035	2036	2037	2038	2039	2040	2041
	14	15	16	17	18	19	20	21
	$139,980,943	$144,591,226	$149,239,732	$153,411,529	$156,076,185	$158,780,812	$161,526,007	$164,312,381
	$139,980,943	**$144,591,226**	**$149,239,732**	**$153,411,529**	**$156,076,185**	**$158,780,812**	**$161,526,007**	**$164,312,381**
	$1,286,173,772	**$1,430,764,998**	**$1,580,004,730**	**$1,733,416,259**	**$1,889,492,444**	**$2,048,273,255**	**$2,209,799,263**	**$2,374,111,643**
	0.28	0.26	0.23	0.21	0.20	0.18	0.16	0.15
	$39,289,024.60	$37,062,110.91	$34,934,823.48	$32,795,780.55	$30,470,704.56	$28,309,340.55	$26,300,261.96	$24,432,830.71

In Project Cash Flow, Equity Paid values are again taken from Sources Uses sheet and inserted into table negatively because these are paid out.

Net Cash Flow values are taken from Cash Flow sheet for each year.

Net Project Cash Flow is the sum of the Equity Paid and Net Cash Flow. It shows the money in account for each year. After net cash flow calculation, cumulative cash flow is calculated by adding money from previous year to the cash flow within each year. In this calculation; the first year (2020) Cumulative value equals to first year (2020) Net value, but Cumulative amount for 2021 is the sum of the first year (2020) Cumulative amount and the second year (2021) Net amount.

All of the other calculations are the same as the Equity Cash Flow Calculation but payback in the cumulative project cash flow starts after 2022 in Project Cash Flow.

Table 26: IRR Calculation – Project Cash Flow

Project Cash Flow		2020	2021	2022	2023	2024	2025	2026
		0	1	2	3	4	5	6
Equity Paid		-$94,599,265	-$102,660,889	$0	$0			
Net Cash Flow		$0	$5,464,426	$146,702,423	$114,839,149	$105,003,865	$96,522,114	$100,908,131
Net		**-$94,599,265**	**-$97,196,462**	**$146,702,423**	**$114,839,149**	**$105,003,865**	**$96,522,114**	**$100,908,131**
Cumulative		**-$94,599,265**	**-$191,795,727**	**-$45,093,304**	**$69,745,845**	**$174,749,710**	**$271,271,825**	**$372,179,955**
Discount Factor		1.00	0.91	0.83	0.76	0.70	0.64	0.58
DCF		-$94,599,264.67	-$88,763,892.64	$122,351,429.90	$87,467,679.99	$73,037,989.44	$61,313,517.38	$58,538,480.58

		2027	2028	2029	2030	2031	2032	2033
IRR	**51%**	7	8	9	10	11	12	13
		$105,239,075	$109,604,053	$114,003,576	$118,438,160	$122,908,334	$127,414,629	$131,957,589
WACC	9.50%	**$105,239,075**	**$109,604,053**	**$114,003,576**	**$118,438,160**	**$122,908,334**	**$127,414,629**	**$131,957,589**
NPV	**$843,015,466.30**	**$477,419,030**	**$587,023,083**	**$701,026,659**	**$819,464,820**	**$942,373,153**	**$1,069,787,782**	**$1,201,745,371**
Payback	**3**	0.53	0.48	0.44	0.40	0.37	0.34	0.31

	2034	2035	2036	2037	2038	2039	2040	2041
	14	15	16	17	18	19	20	21
	$136,537,762	$179,910,753	$143,234,460	$184,236,047	$186,908,717	$189,621,477	$192,374,928	$195,169,681
	$136,537,762	**$179,910,753**	**$143,234,460**	**$184,236,047**	**$186,908,717**	**$189,621,477**	**$192,374,928**	**$195,169,681**
	$1,338,283,133	**$1,518,193,886**	**$1,661,428,346**	**$1,845,664,392**	**$2,032,573,109**	**$2,222,194,586**	**$2,414,569,513**	**$2,609,739,194**
	0.28	0.26	0.23	0.21	0.20	0.18	0.16	0.15
	$38,322,612.87	$46,115,331.28	$33,529,077.70	$39,385,338.32	$36,490,129.99	$33,807,982.87	$31,323,197.32	$29,021,232.28

Loan Life Coverage Ratio (LLCR) Calculation

Loan Life Coverage Ratio shows how many times the money obtained during the operation period can cover the credit debts of the construction period.

In the LLCR calculation, Net Present Value is calculated above. For the first year (2020) LLCR value equals to NPV of Project Cash Flow. For the following each year, NPV of 2021 equals to summation of Discount Factor in Project Cash flow which begins from 2021 and ends in 2041 and it goes on consequetively. It means value of NPV for 2022 equals to summation of Discount Factor which begins from 2022 and ends in 2041.

For the first year (2020) Loan Balance value is taken from Sources Uses sheet, for the second year (2021) Loan Balance value is again taken from Sources Uses sheet but the previous year value is added to this year value. For the following each year begin from 2022, values are taken from Loan sheet which is Loan End Balance.

Loan Balance in Loan Life Coverage Ratio Calculation equals to Loan Amount that is on the Loan sheet.

Loan Life Coverage Ratio is calculated by dividing Net Present Value (NPV) to Loan Balance. This result indicates the firm's power to cover its credit debts compared with the minimum and average LLCR values.

In the model, the lower limit of average loan life coverage ratio is determined as 2 by the bank and the lower limit of minimum loan life coverage ratio is determined as 1.10. As shown below, the results calculated for average and minimum LLCR are higher than the determined limits. So, we can say that this firm has the capacity to cover its credit debts with income that obtained during operation period.

Finally, the PPP between MNR (Ministry of Resources, Kazakhstan) and NickTOLL is a profitable partnership. The IRR of the project for NickTOLL is 51% and 20 years' revenue of MNR is USD 750 million. The advantage to the private company and to public entity has been realized as explained below throughout the text of this thesis study.

Table 27: LLCR Calculation

		2020	2021	2022	2023	2024	2025	2026
NPV	$843,015,466.30	$843,015,466	$937,614,731	$1,026,378,624	$904,027,194	$816,559,514	$743,521,524	$682,208,007
Loan Balance	$460,273,691.57	$220,731,617.57	$460,273,691.57	$451,068,218	$440,712,060	$429,205,217	$405,040,849	$368,218,953
LLCR	1.831552578	3.82	2.04	2.28	2.05	1.90	1.84	1.85

Average LLCR	2.59
Min LLCR	1.84

		2027	2028	2029	2030	2031	2032	2033
NPV	$843,015,466.30	$623,669,526	$567,915,249	$514,886,222	$464,513,966	$416,722,488	$371,430,017	$328,550,502
Loan Balance	$460,273,691.57	$331,397,058	$294,575,163	$257,753,267	$220,931,372	$184,109,477	$147,287,581	$110,465,686
LLCR	1.831552578	1.88	1.93	2.00	2.10	2.26	2.52	2.97

Average LLCR	2.59
Min LLCR	1.84

		2034	2035	2036	2037	2038	2039	2040	2041
NPV	$843,015,466.30	$287,994,903	$249,672,290	$203,556,958	$170,027,881	$130,642,542	$94,152,412	$60,344,430	$29,021,232
Loan Balance	$460,273,691.57	$73,643,791	$36,821,895	$0	$0	$0	$0	$0	$0
LLCR	1.831552578	3.91	6.78						

Average LLCR	2.59
Min LLCR	1.84

12. CONCLUSION

There are several views on PPP model. Some part of people has the idea that it is a kind of privatization and the name of the model as PPP is nothing but trick of words, meantime the other part defends the idea that the public services are provided in a better and efficient manner due to the resolution of financial burdens by private sector arisen while public services are performed.

The main problem encountered in performing of public services is the insufficiency of the funds. When a solution is sought for this problem, the private sector capital can be used in public service investments and so that PPP plays an important role that the insufficiency of funds can be resolved providing more efficient and quality public services. On the other hand, because of the fact that PPP model incorporates several sub-models applicable in its entirety such as BOT, BR, BO, BOOT etc., and determination of the limitations of any of these sub-models is based on creativity of the parties involved; PPP provides easier realization of projects to come into life. In the end, financial load on the public service can be decreased and a faster, more efficient quality public service can be provided.

Within this study, project finance modelling example used very often as "Build-Operate-Transfer Project applied to a nickel mine" is given. In this modelling, Ministry of Resources, Kazakhstan (MNR) allocated the mine without cost to the company called NickTOLL as assigning concession rights. Based on the PPP agreement signed, NickTOLL established mine extracting facility in 2020-2022 and operated the mine for twenty years' period 2022-2041. In the end of twenty years' operation period, the mine facility has been transferred to MNR.

The point which provides a better clarification to understand PPP model is: NickTOLL established a mine extracting facility and has taken back his money invested during construction period and has reached to the profit he aimed for. In the end of twenty years' operation the mine facility transferred to the state. By this way, an infrastructure project has been realized by private sector financing and private sector has got incomes he desired. As seen from the financial modelling, this is

profitable project for both sides. In this respect, application of PPP model provides various advantages to the sides.

When looked from the point of view of Private Sector, the private companies not very well known in the market, may catch the opportunity to prove themselves by involving in PPP projects. The public side, without having financial loads, may provide public services within a reasonable proper budget. It must be born in mind that not all of the PPP projects are profitable in spite various advantages aside and may lead the sides into troubles in long term cooperation. In order to prevent this, a proper and realistic feasibility is essential in addition to a strong and reliable project financing.

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