



Mini Case 2017

OCTOBER
2017



ST. PETERSBURG
INTERNATIONAL
GAS FORUM
YOUTH DAY

ORGANIZERS & PARTNERS



PERFORMED BY



OCTOBER
2017



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YOUTH DAY

Introduction

Youth Day 2017 has been organized to encourage interaction between masters students and the energy sector. The event provides a great opportunity for students interested in the gas or energy sectors to demonstrate their leadership skills by taking part.

This case is designed by UNECON team (Higher Economic School and International Business Department, Saint-Petersburg State University of Economics) in order to determine the industry and market vision of the Youth Day participants. The completion of the task involves the search for certain amount alternative solutions using analytical skills, as well as the ability to provide the result in the form of an essay.

You need to complete the task and to send by mail to youthday@hes.spb.ru by June 30, 2017 (23.59 UTC+3). If you receive a high mark on the task, you will be invited to become a participant of Youth Day.

Key Features

LNG REGIONS



Modern gas market obviously transforms in a more complex, mobile, industry, which includes both production capacities for liquefaction and regasification, the gas pipeline network, trading operations and specific route maps. In the past decade the growth in demand for LNG was mainly in the countries of Asia and Europe, where LNG was used for electricity or in the industrial sector. In the long term, the growth in LNG demand will be ensured by the need for clean energy sources in China, for electricity generation in South-East Asia and Latin America, as well as for the needs of growing population in the Middle East or for the need to replace liquid hydrocarbons by natural gas in the electricity sector in Europe.

According to Petroleum Economist, there are currently 55 LNG plants in the world. Until 2020 there is planned to launch 15 new LNG enterprises with a total capacity of 100 million tons. Shell predicts that by 2030 there will be 50 LNG importing countries in the world that makes LNG market truly global.

The forecast for new LNG capacities remains relatively stable: about 80% of new LNG volumes will come from three regions: North America, Australia and Eastern Africa. At the end of 2016, the world's LNG capacity was 445 bcm. However, 14.6% of the installed capacity (65 bcm) was not used.

Dear participant, the assignment provides you the opportunity to demonstrate both industry knowledge and global thinking skill. Also you are able to present your own business model in the LNG industry and its flexibility on the specifics of the region regarding the balance of export-import balance, production facilities and terminals, trading cards, strategic partnerships.

Feel free to use **purple** and **emerald** colors! You must be bold and confident in creating a formula of business success! Learn the fascinating map of LNG future!

Key Features

LNG REGIONS

Judging from the report of the International Gas Union 2016, there are currently 108 LNG terminals around the world, 25 of which are in Japan and 10 in the United States. Among 20 new regasification terminals that will be launched in the next three years, 17 of them will be positioned in Asia. 10 of the planned terminals will be located in China. This country is the largest coal consumer as well as the world's largest CO₂ emitter. In India, which is also one of the world's largest emitters of greenhouse gases, there are only 3 terminals under construction now. Concerning the existing capacities in India, it counts for 4 terminals.

In the market, there is a decline in prices for LNG, as well as a growing number of innovative solutions to deliver fuel to new markets at a lower price. The growth in demand for LNG is also associated with the use of LNG as a transport fuel. Although, currently, LNG volumes in rail and sea transport are small, the use in cryogenic aviation are promising, this direction can develop quickly if it receives stable support at the legislative level.

The LNG industry is actively developed. It is expected that by 2035 it will account for more than half of international gas trade. Industry leaders positioned in the LNG industry create global strategies, adapt their own business solutions to the needs of regions, and form mobile business models.

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SOUTH AMERICA

South America has great potential in expanding LNG import. However, the largest consumers (Brazil, Argentina) do not plan to support import instead of developing domestic production. At the present time, the countries are constantly struggling with energy crises by importing LNG.

Brazil consumes on 70% more gas than it produces. So this country is the largest consumer of energy in Latin America as well as the largest consumer after the US and Canada in the Western Hemisphere. Since 2009, Brazil has been importing LNG from such countries as Nigeria, Norway and Trinidad & Tobago by three floating LNG regasification terminals. Total capacity of the terminals exceeds the capacity of Gasbol, the main pipeline. At present, terminals are loaded at 1/3 of its capacity. A similar situation is evident in Argentina. This country is one of the most promising gas-bearing regions with a developed gas pipeline network. Chile became the most active buyer of US gas over the past year. By 2018, the country plans to increase its LNG import capacity by more than 70%.

A single liquefaction plant in South America is located in Peru, in Pampa Melchorita. The plant capacity is 4.4 million tons per year (the main direction of supplies is Spain, Mexico). Peru is the saturated country with large natural gas reserves in the South American Pacific region

EXPORT (10 ⁶ T)	IMPORT (10 ⁶ T)
Peru 4,2	Mexico 4.10
Trinidad & Tobago 10,46	Argentina 3.42
	Chile 3.20
	Colombia - 0.06
	Brazil 1.46

LIQUEFACTION

Current capacity, MTPA

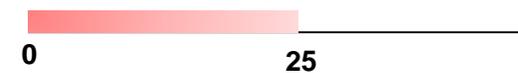


Planned capacity, MTPA



REGASIFICATION

Current capacity, MTPA



Planned capacity, MTPA



EUROPE

There are 23 large LNG terminals in Europe. 21 terminals are located in the EU countries and 2 more terminals in Turkey (the total regasification capacity of all LNG terminals is about 200 billion cubic meters per year, which can cover about 40% of gas needs Europe).

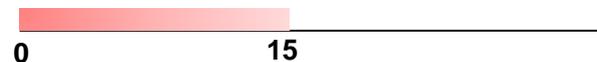
European countries within the framework of diversification of gas supplies programs and projects for the commissioning of new LNG terminals are referred to projects of pan-European importance. Spain is one of the fastest growing LNG markets. The leaders in gas consumption are Germany, Great Britain and Italy

In Europe LNG competes with gas supplies through the pipeline network, especially from Russia. Russia is the main supplier of pipeline gas to Europe with a share of about 30%. Regarding LNG, the major part of supplies is mainly from Qatar (a traditional European supplier), Norway, Algeria and the USA. At the same time, the gas exporting countries like Russia and Norway also have the potential to develop LNG supplies by actively mastering this market.

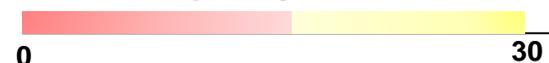
EXPORT (10 ⁶ T)	IMPORT (10 ⁶ T)
Russia 10.70	Spain 10.17
Norway (4,49)	Norway 0.16
	UK 7.48
	France 5.55
	Turkey 5.47
	Italy 4.59
	Portugal 1.31
	Lithuania 1.00
	Poland 0.82
	Belgium 0.79
Greece 0.53	

LIQUEFACTION

Current capacity, MTPA



Planned capacity, MTPA

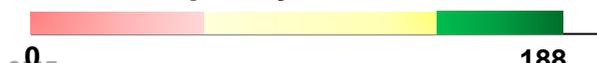


REGASIFICATION

Current capacity, MTPA



Planned capacity, MTPA



NORTH AMERICA

The region is not only a major consumer of gas, but is also gradually becoming the focus of exporting countries. So, the US until recently covered the bulk of its pipeline gas needs with imports from Canada, while building 12 receiving LNG terminals. But due to the discovery of shale reserves, it may become the third largest exporter of LNG in the world (EIA) by 2020. However, the prices of American LNG are still very high. Canada, the world's fifth-largest gas producer and fourth largest exporter, sends a large share of exports to the US via a pipeline network.

However, Canada also has very strong incentives for increasing LNG exports due to the reduction in US imports and the territorial proximity to the Asia-Pacific regional market. Despite the fact that there are 25 projects to develop LNG exports on the eastern coast (4 projects) and the western coast (21 projects), the most promising is the development of projects in the British Columbia area.

Mexico acts as the main consumer of US gas mainly on transboundary pipelines and imports LNG from Trinidad and Tobago, Egypt and Nigeria.

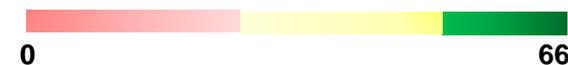
EXPORT (10 ⁶ T)	IMPORT (10 ⁶ T)
USA (2.64)	USA 1.59
	Canada 0.23
	Jamaica 0.01
	Mexico 4.10
	Dominican Rep 0.80

LIQUEFACTION

Current capacity, MTPA



Planned capacity, MTPA



REGASIFICATION

Current capacity, MTPA



Planned capacity, MTPA



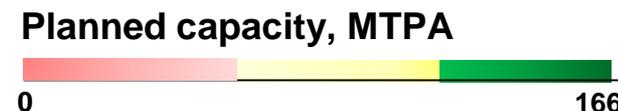
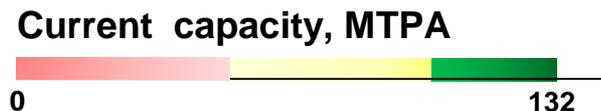
ASIA-PACIFIC REGION

The countries of the Asia-Pacific region consume 75% of the world's LNG production. The leaders of consumption are Japan, South Korea and China. Japan is currently the world's largest LNG buyer. LNG in the region is supplied mainly by Qatar, the United Arab Emirates, Australia and Malaysia. South Korea ranks 2nd in the world with imports of 33.7 million tons. At the same time, gas consumption is growing rapidly in China.

Today, despite the fact that China is one of the largest producers of natural gas in the world, the country also ranks third in terms of LNG imports. The total capacity of regasification terminals is more than 40 million tons per year. India is ranked 4 in the list LNG consumption countries. In the next ten years Australia will outstrip Qatar and become the leader of the LNG market. Australia has huge gas reserves. In addition to the already existing LNG plants, 7 new projects are being implemented in the country. If the additional LNG production capacity, which is currently under development, will be launched till 2020, the potential LNG export volume will be the highest in the world - almost 11.5 billion cubic feet. There are already set long-term contracts for most of the products from new LNG capacities in Australia.

EXPORT (10 ⁶ T)	IMPORT (10 ⁶ T)
Australia 44,8	Japan 83.34
Papua New Guinea 7,66	South Korea 34.19
Indonesia 19,95	Indonesia 3.23
Brunei 6,29	Thailand 2.99
	Pakistan 2.95
	Singapore 2.07
	Malaysia 1.32
	China - 27.42
	India 18.99
	Taiwan - 15.07

LIQUEFACTION



REGASIFICATION



AFRICA & MIDDLE EAST

The Middle East supplies 40% of LNG to the world market. Qatar is undoubtedly a leader (12 plants with 13 production lines) in terms of production and export with a share of 32%. 72% of supply volume is directed to Asia and just 23% to Europe. Also Oman is one of the main exporters with LNG supply to Spain and some Asian countries.

The potential of the Middle East in this area is also related to LNG demand : terminals for reception in Egypt and Jordan have been put into operation. A terminal is being built in Morocco while the construction of terminals in Bahrain, Kuwait, Pakistan and Iran is planned. LNG consumption increased by 61% and 20% in AOE and Kuwait respectively, reaching 2.5 and 3 million tons. Complex and extremely complicated relations between the countries in the region hinder the construction of cross-border pipelines.

At the moment, there are only two regasification terminals on the African continent, and both in Egypt. The supply of gas via pipelines from continental producers - Algeria, Nigeria and Libya is also difficult: in Africa there is practically no gas transportation infrastructure. One of the leaders in liquefaction in Africa is Nigeria with a capacity of 22 million tons of LNG per year.

EXPORT (10 ⁶ T)	IMPORT (10 ⁶ T)
Egypt 0.51	Egypt 7.50
Angola 0.76	Kuwait 3,49
Nigeria 17,78	Jordan 3,06
UAE 5,86	UAE 3,10
Equatorial Guinea 3,37	Israel 0,28
Algeria 11,44	
Oman 8.12	
Qatar 79.62	

LIQUEFACTION

Current capacity, MTPA



Planned capacity, MTPA



REGASIFICATION

Current capacity, MTPA



Planned capacity, MTPA



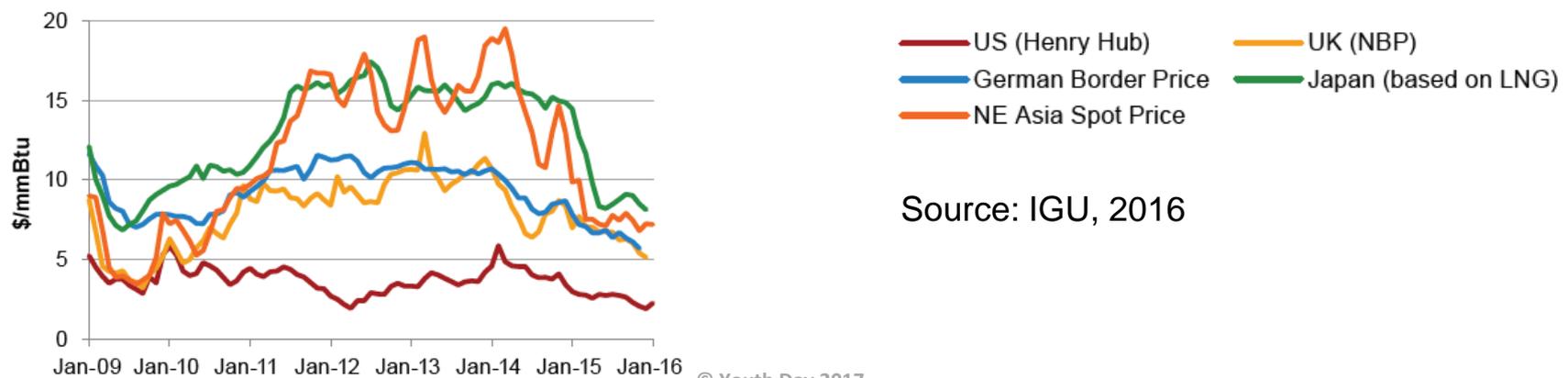
Key Features LNG TRADING

TENDENCY

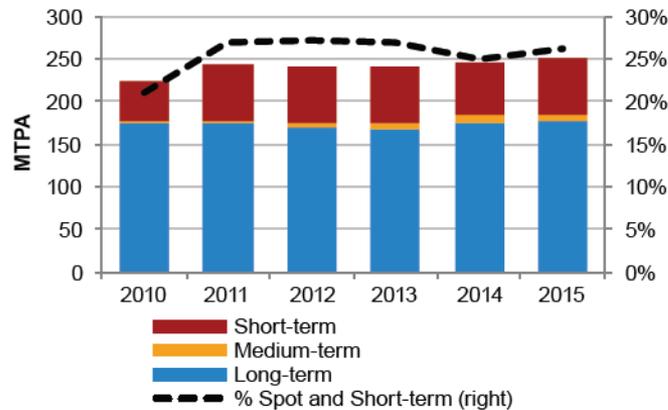
LNG trade becomes one of the most dynamically developing sectors of gas trading. LNG trading includes chartering, hedging and tendering. A secure future of the LNG market attracts more and more new players every year. It also causes interest for trading by various industry participants. The world LNG trade volume is forecasted to double till 2035.

PRICING OVERVIEW

Historically, prices in LNG trade are analyzed in two regions: the Pacific and the Atlantic. In the Pacific region, prices were higher and most likely based on price formulas related to oil products than prices in the Atlantic region. Since the fall in oil prices all over the world, there has been a noticeable convergence in international prices for LNG. The reason is the reduce of the difference between the Atlantic and Pacific regions. Although the base price remains the same, when most of the LNG in the Pacific basin continues to trade on oil-related formulas, the fall in oil prices has led to a decrease in the absolute price of LNG in the Pacific to levels similar to market prices in the Atlantic. Oversupply LNG volumes along with reduced shipping costs provide traders an opportunity to move cargo between regions so quickly as the which price arbitrage was reduced.



Key Features LNG TRADING



- **Intra Pacific**
- **Middle East - Pacific**
- **Middle East – Atlantic**
- **Intra – Atlantic**
- **Atlantic – Pacific**

SHORT-TERM CONTRACTS

Over the past few years, the volume of spot and short-term deals with LNG has increased significantly. Spot trade implies LNG deliveries within a period less than 3 months. LNG is considered more "convenient" in terms of transportation and more "variable" in terms of sales volumes. In 2016 the volume of transactions with a validity period of less than 2 years constituted about 30% of the volume of LNG transactions. LNG trading provides customers with a variety of gas supply options without the need to enter into long-term contracts with a particular manufacturer. Medium-term contracts (from 2 to <5 years) also became well-established form in the LNG market in comparison with long-term transactions. Medium-term contracts are preferable for buyers with an unstable level of demand for this resource. This trend, as well as the requirements for transportation of liquid fuels, determine the similarity of oil trading and LNG trading.

NEW PLAYERS & ROUTES

Not surprisingly, large oil traders, for example, BB Energy and Glencore, are also actively involved in LNG trade. ExxonMobil, Sinopec, Qatar Petroleum have already announced projects in the field of LNG trading. Russian companies are not an exception to the global trend. All major Russian players are interested in LNG trading. This segment is occupied by Gazprom Marketing & Trading.

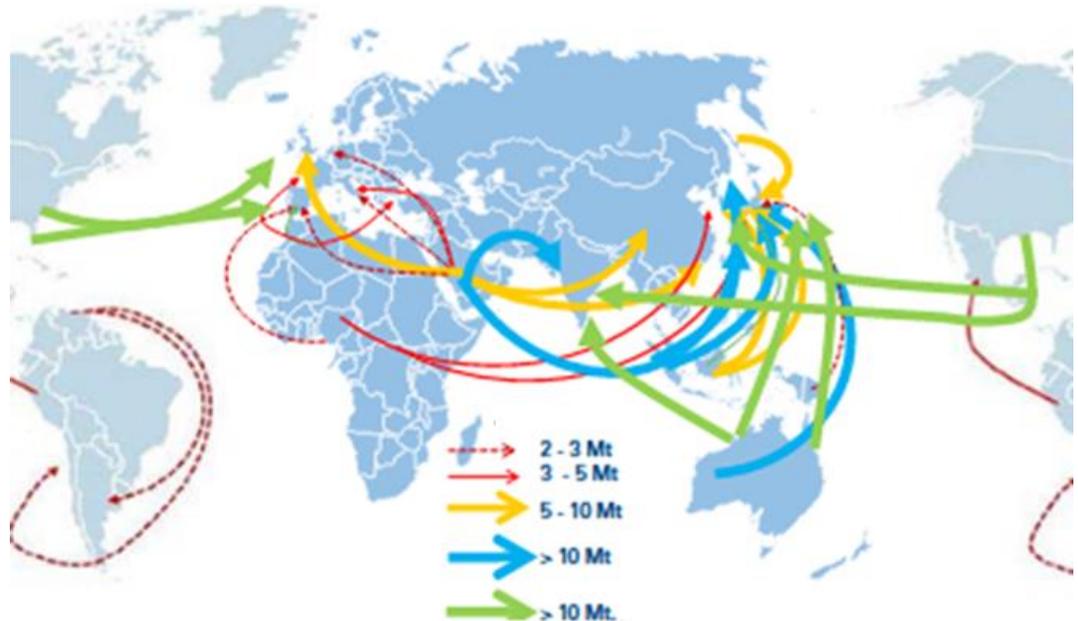
Concerning the regions of LNG trading, it is worth looking at 5 allocated trading routes: Intra Pacific, Middle East-Pacific, Middle East-Atlantic, Intra-Atlantic, Atlantic-Pacific.

Major Trade Flows

LNG TRADING

The largest route remains the so-called Inter-Pacific, which accounts for 39% of the world trade. Historically, this share was significantly higher (about 70% in the early 1990s), but a boom in supplies from the Middle East and the Atlantic region reduced the share to 34% in 2012. However, the launch of projects in Papua New Guinea (PNG) and Australia significantly increase the volume of trade on this route in 2015 (+9.4 million tons).

The greatest decrease in regional flows in 2015 was observed in the direction of Middle East-Pacific trade, as new projects in the Pacific region and in combination with stagnation of millet displaced suppliers from Qatar. The volume of trade on Atlantic-Pacific has significantly decreased (-4.0 million tons) due to the fall of European re-exports. Nevertheless, experts predict a recovery in volume in connection with the launch of projects in the US in 2017.



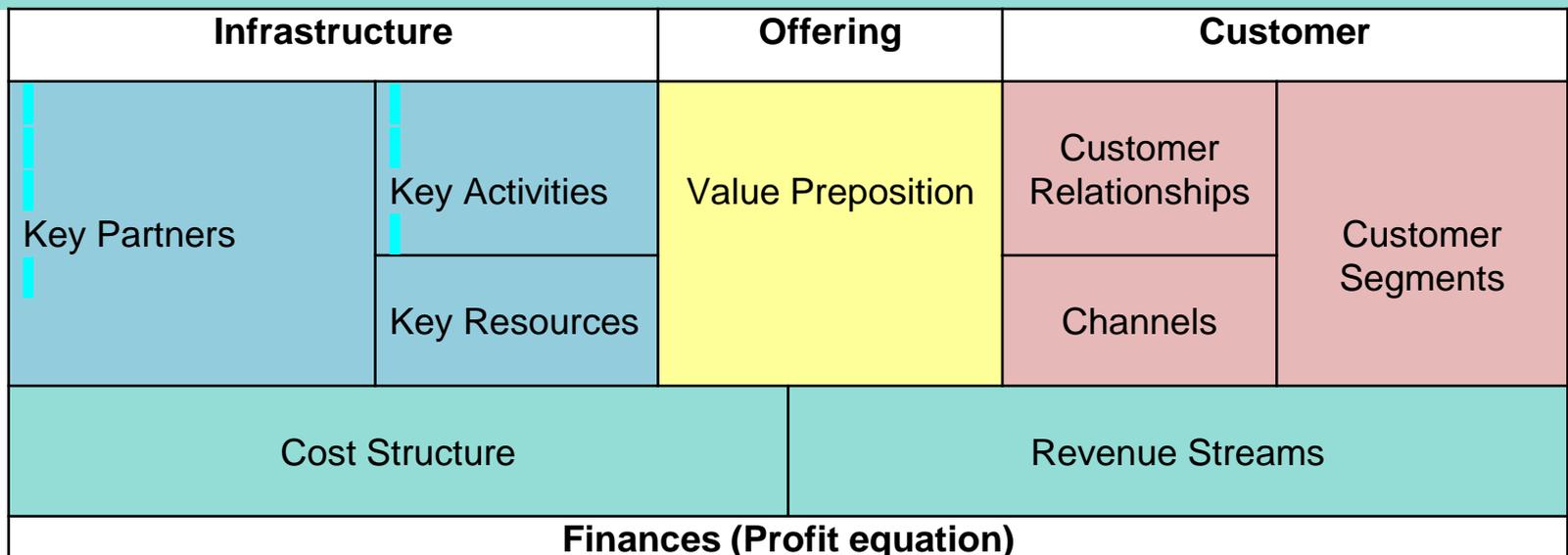
Source: IGU, 2016

Business Model LNG INDUSTRY

The business model of the company helps to figure out how the organization receives (or intends to receive) its profit, and also describes the logic that underlies the successful market and financial functioning: what resources enable the company to create value proposition for potential customers, how it creates, sells and delivers its products and services (Gill, 2000). Finally, the business model helps to take the step from the strategic plan of the company towards the operational and tactical actions.

Components of business model are defined by experts in a variety of configurations, but in recent years one of the most well-known and recognized tools of strategic management is represented by Business model Canvas created by A. Osterwalder and Y. Pigneur. The model is designed, primarily, for the value assessment of the current business, as well as applied for structural analysis of the existing business model to identify areas of vulnerability or new “growth areas”.

Business Model Canvas



Business Model LNG INDUSTRY



Business model canvas consists of 9 quadrants (blocks) that can be combined into four areas:

- **Infrastructure** area describes the way and tools of company value production (e.g., production processes of the enterprise);
- **Value proposition (Offering)** area represents a product or service offered by the company in the market;
- **Customers** area describes the major market segments, target customers;
- **Finances (Profit equation)** area characterizes the features relating to the organization of both incoming (pricing policy) and outgoing (cost structure) financial flows of the company.

Infrastructure covers three blocks: *key processes* which are the most important activities in the value chain addressing the company's customers; *key resources* (human, financial, capital goods, intellectual) required to create value for the company's customers, *key partners* with relationships affecting the process of value creation for the company's customers (interaction with partners can be implemented in various forms: strategic alliance, joint venture, etc.).

Describing the **customers** of the organization also includes three blocks: *customers needs* and characteristics of the target market; *distribution channels* which are the methods of product or service delivery to the customer that meet their needs regarding speed, efficiency and cost; the *relationships* which are a variety of formats to attract new customers, to retain the existing ones and to develop relationships with them.

Product creation and sale are based on the **financial model** of the organization which is described by two blocks: *cost structure* with expenses that are required to create a product or service; *revenue streams* as a way to attract cash flows at each of the market segments in which the company operates.

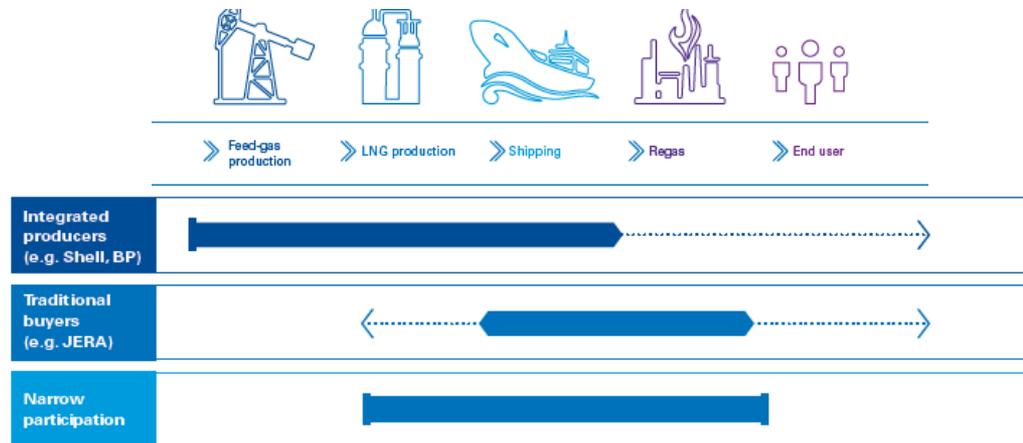
Business Model LNG INDUSTRY

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The same product/service may apply a significant number of business models. It is recommended to create alternative business models, considering different scenarios of business development, to ensure effective use of the business canvas. LNG market earlier characterized by a certain set of business models, undergoes transformational changes. The traditional model with fixed long-term contracts between the sellers owning the upstream fields and liquefaction infrastructure, and buyers who receive the LNG at import terminals for their domestic market, and fixed destinations, is being transformed into a dynamic, interactive market. When previously the organizations operated on a small piece of the value chain, ignoring the adjacent areas due to the lack of competencies, missing trading skills, now the boundaries between producers, transporters, traders and consumers become less distinct.



Source: KPMG Analysis, 2017

Some providers offer integrated end-to-end solutions. This is driven also by the expansion of the range of business capabilities - suppliers and buyers master the skills of trading and forecasting. For example, Shell is involved at every stage of the LNG value chain: having interests in upstream business, liquefaction and regasification plants.

Business Model LNG INDUSTRY

Moreover, Shell is one of the world's largest LNG shipping operators, managing and operating more than 40 carriers (10% of industry-wide fleet). A number of companies, e.g., Japanese Jera, act simultaneously as a supplier and buyer. Mitsubishi has started with importing LNG for Japanese utilities. Since then, the trading house has been steadily expanding its operations, investing in liquefaction plants and LNG shipping.

Therefore, the portfolio players take the leadership with their investments in upstream and creation of liquefaction plants, as well as with a number of long-term contracts on LNG purchase and long-, medium-, short-term contracts for sale to various customers. Mostly these are majors and 'second tier' international upstream oil and gas companies, though sometimes there are independent producers. LNG Traders play here an active role as they generate profits through sale of short-term contracts. Their business model is based on flexibility as it does not contain any restrictions imposed by long-term agreements and capital intensity of owning upstream assets.

The specific character of oil and gas industry, in particular of the LNG sector, defines the shift towards the input part of the business model. This is due to several factors. Liquefied natural gas is a standard (not branded) product, though some major players have started to mark their LNG, as its quality depends on the feed-gas region. Consumer segments are formed by major national oil companies, traders and SME manufacturing companies. Channels are transformed into Supply chain management, focusing on the following combination – providers, customer relations, shipping methods. Revenue sources/streams are distinguished in established formats: selling own gas and re-selling gas, as well as short- and long-term contracts.

Business Model LNG INDUSTRY

Therefore, the opportunity to provide the required value proposition for customers, i.e., to provide LNG deliveries in the proper volume with short transport shoulder, depends on the available resources: basically gas, technology of its production, liquefaction, regasification, partnership relations. Business model formation requires considering the involvement of the company in the gas production projects and geographic location of deposits and production facilities for gas liquefaction; pool of partners cooperating with the company at the moment and those with whom they can enter into new projects in other regions.

We use the following letters to describe the basic elements of actual business models:

- R - Key resources**
- I - Cost structure** – *investment diversification,*
- P - Key partners,**
- S - Channels** - *supply chains,*
- C - Customer segments,**
- O - Revenue streams** – *orientation of contracts period,*
- T - Key activities** – manufacturing and technological capabilities.

RIPSCOT- approach is an abbreviated representation of the business model of companies operating in the LNG markets as portfolio player. It allows to appeal to the most important (priority) activity elements that define the capabilities of the company, its functioning features and priorities in development areas. For this we put the letter, symbolizing the priority element of the business model, as a capital one (**R**ipscot, r**I**pscot, rip**S**cot etc.)

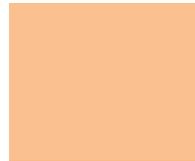
R
I
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ASSIGNMENT #1

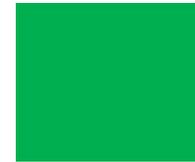
- Below, on the map, there are five regions selected. You need to select the color for the region you want to colorize. The choice of the color should be based on the analysis of market potential, regasification possibilities, pipeline infrastructure. All the regions should be colorized.



If the region is less preferable from import perspective

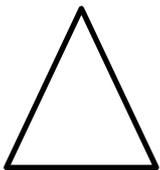


The potential of the region should be analyzed

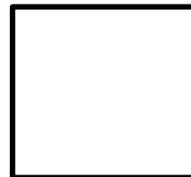


If the region is more preferable from import perspective, such region is called “emerald”

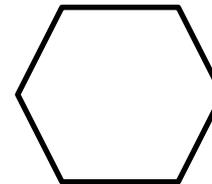
- As already you have chosen the color, you have to choose a shape of the figure for each region.



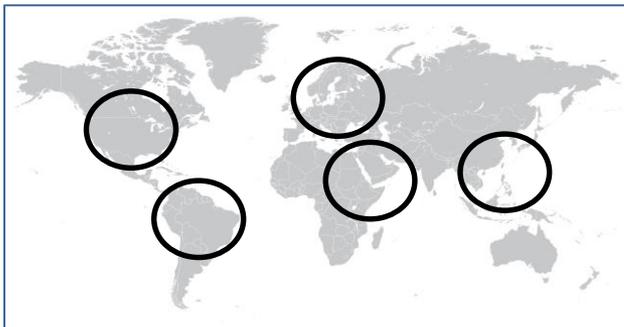
If the region is less preferable from export perspective



The potential of the region should be analyzed



If the region is more preferable from export perspective

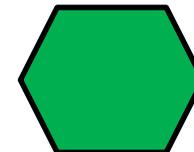


- As a result of completion this task we ask you to send a colorized map. For each region you have to choose a combination of color and shape (instead of transparent circles)

Sample



Or



ASSIGNMENT #2

- Select one of the large companies operating in the region you have chosen to be **emerald**. Following the LNG activities, resources, customers, etc., you should define which element in the company business model plays a key role for further development as well as for priority changes in the business model up to 2035.

Use RIPSCOT formula in highlighting the key element with **a capital letter**. Possible options are respectively:

Ripscot, **r**ipscot, **r**i**P**scot, **r**i**P**scot, **r**ip**S**cot, **r**ip**S**cot, **r**ipsc**O**t, **r**ipsc**O**t, **r**ipsc**O**t, **r**ipsc**O**t.

Explain your choice on a **key element** with the arguments in a table below **(2-3 abstracts)**.

Give the links on the websites, publications, analytic reports or other sources used.

Sample

riPscot. P - for Partners. Partnership is the most important element for LNG business-model in near future for <i>Company</i> , as..	List of sources <ul style="list-style-type: none">• Company official site• KPMG analysis (link for report)• <i>Etc.</i>
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So, your final answer for Assignment #2 should consist of the following elements:

- the name of the selected company;
- the RIPSCOT formula describing the dynamics of the business model of the company with one key capital letter;
- the table with 2-3 abstracts of explanation and links for sources used.

Useful Links and Materials

PWC reports <http://www.pwc.com>

KPMG Reports <http://www.kpmg.com>

Hydrocarbones <http://www.hydrocarbonprocessing.com>

McKinsey <http://www.mckinsey.com>

IGU <http://www.igu.org/>



This map you may use for completion an assignment #1

Both assignments (map and table) should be completed in a single document. Please do not send us two or more files with the case solution.

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Expert Support

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Analyst, “LNG Regions”

Acknowledgements

The authors would like to offer our special thanks to our colleagues from **Uniper Global Commodities** for their support and assistance with this project.



Best Wishes!

The task may be challenging but we believe that you are able and competent to find the best solution.
We are confident in your creativity and ability to complete the assignment!

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