INTEGRATED LNG VALUE CHAIN FOR THE BALTIC SEA REGION

WP3 Task 2: Integrated LNG Business Models

BUSINESS MODELLING AND VALUE PROPOSITION TEMPLATES FOR DELIVERING PARTNERS

Working Document

Project:	"LNG Value Chain for Clean Shipping, Green Ports and Blue Growth in Baltic Sea Region – Go LNG" (ERDF part-financed, Baltic Sea Region Programme 2014–2020)
	WP3 – Integrated LNG Value Chain, Task 3.2
Responsible:	PP5 – WU
Scope of the event:	Working Group Template
	Working languages: English
Delivering partners:	Go LNG Project Partners
	Business Cases for LNG Business Model Development:
	- Klaipeda Science & Technology Park – LNG distribution centre for BSR based on ISO container technology production and filling center - Klaipedos Nafta – Klaipeda LNG terminal infrastructure to be used as LNG distribution and storage hub for LNG in South East of BSR - Logistikinitiative Hamburg – LNG use for Maritime, Road transport and Port equipment in port of Hamburg - Wismar University of Applied Sciences – Task Leader, Implementing Overall Task
	Associated Partners, Strategic Consultants and Experts
Deadline for filling in:	first draft by the 28th September 2017

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education – research – furtherance of cooperations

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Template for LNG Business Model

1. Key Partner

Lithuanian LNG cluster established on a basis of the Project Go LNG aims at developing Klaipeda LNG terminal as a distribution hub for BSR. In this particular business plan, it will be used a case to promote LNG distribution opportunities evaluating the cluster content as a business model.

Emerson, Western shipyard and DNV GL has signed the agreement to jointly develop a concept of Liquid intelligent tank, solution for LNG distribution based ISO containers and IoT technology. This solution would be applicable for a wider LNG distribution in BSR for bunkering and energy purposes also would ensure safety and emission monitoring. Solution is defined as Liquid Intelligent Tank

2. Key Activities

1. *Developing the IoT solution for monitoring LNG distributios safety and enable efficient operations,*
2. *Starting the LNG container production and maintenece operations.*
3. *Enablig container rent and operation procedures.*

3. Key Resources

Klaipedos nafta has started the operation of small scale distribution station in Klaipeda. Due to this fact LNG become available for distribution purposes in BSR. This is the major

resource for a described business model. However, it can be replicated in any region or port where LNG could be accessible.

Western shipyard is one of the biggest steel fabrication companies in Baltic sea region, company contains of all the relevant infrastructure and production capacity required for a tank production.

Emerson is an automation technology provider for energy sector, able to design and supply the IoT solution for Liquid Intelligent Tank (LIT). To ensure virtual pipeline services.

DNV GL is a classification company with all the relevant knowledge on LNG Market and procedures to be applied in the LIT product concept.

4. Customer Relationships

Please enter your information here

5. Channels

The trade channels for a case is BtoB based sales practice. As the region is establishing a better LNG access there are business partnership events and conferences organized that is a great sales channel. Also, lustering activities are enabling strong sales support since the project is developed by 3 institutions that have well established sales channels.

6. Customer Segments

The LNG distribution and filling centre in BSR business case is oriented to 3 major customer segments.

1. Shipping

Due to the environmental regulations shipping in one of the industries adopting LNG as a fuel. Since shipping is a large consumer of energy the LNG application enables and attractive distribution market. From the LIT product perspective distribution center would establish a better access of LNG for bunkering purposes supplying containers to the place requested by customers. In this case the cost of LNG bunkering infrastructure would be significantly lower. Also, the solution would target core ports that by the EU clean fuel strategy are obliged to provide LNG bunkering services by 2020. LIT would supply a concept that would enable core ports to comply with regulations.

2. Energy

In Baltic Sea Region there still are places that has no gas grid access. Since gas is a great option for a district heating and industry energy supplies the dement for a small-scale LNG supply in energy sector is growing.

3. HD transport

When LNG becoming more accessible it is also applied as a clean fuel option for road transport especially trucks. Gas does not contain sulphur and particle emissions and is attractive for big cities. Also, the first transportation trials define that LNG can decrees fuel cost by up to 40 %

7. Cost Structure

The cost structure in this particular business case is based on 2 aspects. The cost of LNG and the cost of distribution. To better represent the cost model, we have selects the case of supplying the 40 Mw power plant that is and average in between energy and shipping power demands.

Supply capacity

LNG Regasification / Gas m3/ per hour	14000 m3
Gas demand yearly	66 000 000 m3
LNG m3 demand per hour	23,3 m3
LNG m3 demand yearly	110 000 m3

Calculation of price

We provide the cost structure based on the commercial proposals in different parts of the supply chain. The evaluation of Gas supplier margin is based on the preliminary discussion with one Gas supplier, the estimation is preliminary since it is a commercially sensitive information the supplier would like to discuss that directly with the customer. Due to the fact that Klaipeda LNG infrastructure is an open access infrastructure you have several options in choosing the Gas supplier via tender procedure. The distribution strategy we have choose is 40' LNG LIT containers.

Price structure	Calculation	Price per MWh
LNG commodity price	Regular commercial practice is that the commodity price of LNG in Independence terminal is based on ICE index. https://www.theice.com/products/27996665/Dutch-TTF-Gas-Futures/data	18.8 EUR/MWh Price 2/14/2017
Gas supplier margin	Gas supplier margin will be set after negotiations with supplier.	1-2 EUR/ MWh
Distribution infrastructure	We base our calculation on the commercial proposal from Western shipyard. The total demand of container to provide weekly transportation is 52 containers. The cost of infrastructure in that case is evaluated with 5 years return of investment and maintenance. Total 6 240 000 EUR. Yearly cost 1 248 000 EUR. 11,34 EUR per m3 of LNG.	1,65 EUR/MWh
Reloading tariff at FSRU	From terminal to smaller ship to deliver at onshore station	1,14 EUR/ MWh
Transportation tariff from FSRU to Reloading station	Bunker ship to deliver from FSRU to onshore station	1,62 EUR/MWh
Reloading tariff to trucks	Loading in to the trucks-containers	2,05 EUR/ MWh

Transportation price by trucks	The commercial proposal on transportation is based on l proposal for ADR container transportation from ELME GAS. This is 1 EUR per/ km the transportation cost for container 1378 EUR. Delivery 44 m3	4.57 EUR/MWh
Total price LNG EUR/ MWh delivery Radom		**31,83 EUR/MWh**

Conversion rate

LNG

LNG-2.500 m³
LNG- 1.125t
17.123 MWh

8. Value Propositions

1. Reflecting trade standarts to enshure eficiency

LIT (Liquid Intelligent Tank) system provided with the IoT technology based on the blockchain model would ensure a smooth operation of the LNG distribution. The system

would provide the information on LNG quality, pressure, temperature, energy value and operational performance. This allows LNG providers to track the contract relevant date to fulfil the contract obligations. Technologically the system in the container would provide data of using the container all the way to issuing the invoice.

2. Emmision monitorrting and safety

The most relevant aspect in the LNG distribution chain from safety and environmental perspective is methane slip. The LIT system would ensure the operational performance and environmental monitoring, that would allow customers to tract the footprint and ensure safety of transportation.

3. Cost benefit

As the distribution centre would ensure the constant flow of containers it could apply the pricing that is based on a full container capacity. In this case 1.65 EUR per MWh. The cost would be more than 2 times if the small-scale users would take the cost of containers on their project.

4. Maintenace

It would be much easier to ensure a quality maintenance operation of the containers, for a distribution center that is linked to the small-scale terminal. Containers would be serviced during the time of loading, that would cut the maintenance costs since you would not need to transport the container to a maintenance spot. Also, the rental of the containers would save customers from a maintenance costs and involved risks.

5. Transportation

Since the ISO containers can be transported by any means of transport, it can be a cost benefit compare to the transportation by trucks. Especially on longer distances using maritime or rail transport.

9. Revenue Streams

As it is defined in the price structure the revenue of 50-52 ISO container distribution centre would be at: 1247400 EUR. 11.34 EUR per m3 of LNG delivered; and 365000 EUR from the daily rent that would include maintenance. Total Revenue:1612400 EUR

10. Please describe your products, services or other experiences that allow you to arrive at Value Generation, Proposition and Capturing from Interactions and Activities along the LNG Value Chain

The LNG distribution and filling center in BSR based on ISO container technology LIT. Would gather value along the distribution chain by applying IoT and blockchain technology to utilize the distribution concept as a trade standard. Implemented IoT solution would allow customers to track the movement and the quality of operation for they energy supply. It would also distribute the trade information automatically to ensure a better planning of the cold chain operations, saving energy (temperature drop) that is equivalent to money.

As LIT will ensure a smooth data distribution along the supply chain it will also save the time for operation enabling a better planning of transportation.

11. Please describe your value proposition according to the Segments of Customer, Performance, Finances & Revenues and Learning Experiences

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12. Please describe any technological, resource-based, legal, environmental or other enablers that facilitate achievement of value and delivery to your customers and your company / institution (governance, technological capacity, distributional links, legal and regulatory framework, etc.)

1. COP 21
2. Maritime emmiosion zones: Sulphur; NOx; Co2
3. EU directive for deployment of clean fuel infrastructure
4. EU clean fuel strategy

13. Please describe how LNG in your business enable the following:

Differentiation –

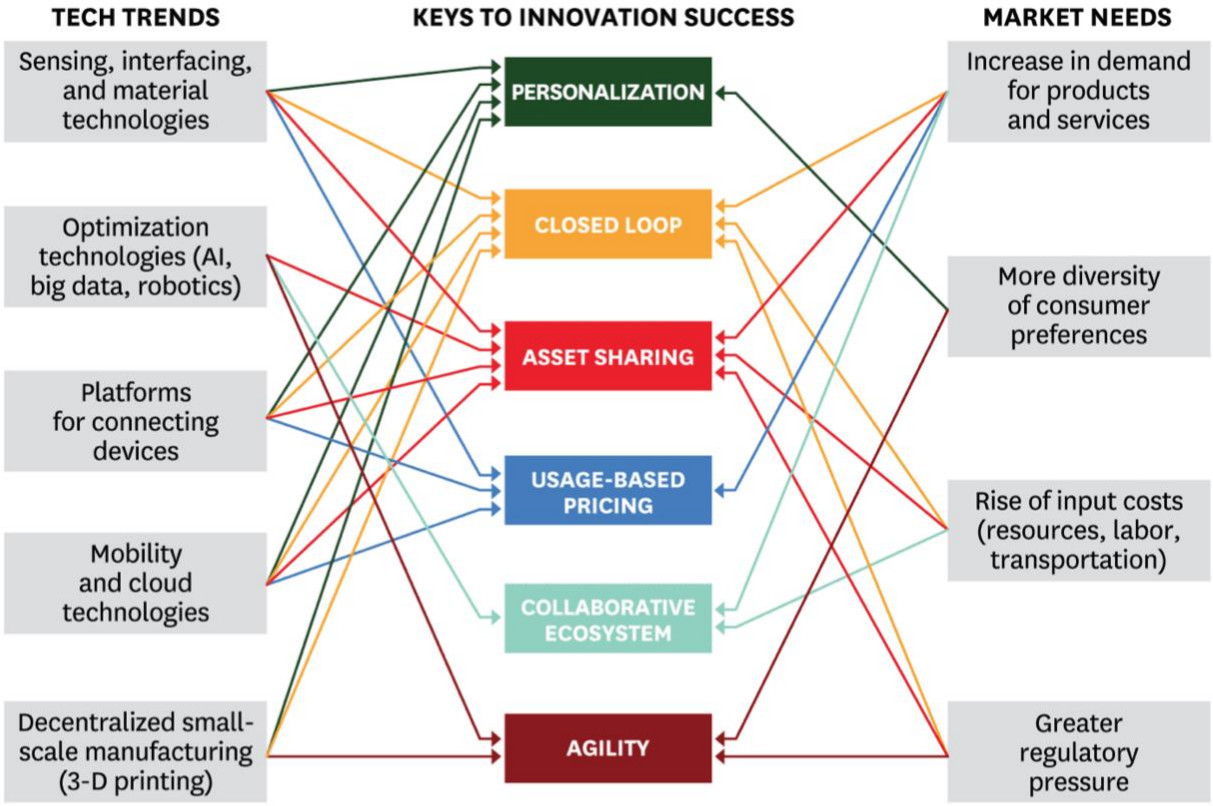
Diversification –

Innovation –

14. Please describe how do you measure value generation (tools, methods) and briefly mention Value Impact Scenarios

Please enter your information here

For REFERENCES



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