**2012 – 2015 Triennium Work Report**

**June 2015**

**Programme Committee D3: SMALL SCALE LNG**

**REGIONAL TEMPLATE**

**REGioN: CARIBBEAN&CENTRAL AMERICA**

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# General overview about LNG industry in the region

# *The only LNG producing (liquefaction) facilities in the area are located in T&T (up and running since 1999) with an overall capacity of 22,4 Mtpa (composed by 4 baseload liquefaction trains). This facility supplies LNG mainly to European and North America markets, but also to the existing regas facilities in the area.*

*An small scale liquefaction project took FID in 2012, Colombian Pacific Rubiales with 0,5 Mtpa capacity the facility is expected to come on stream by 2015.Since many years ago, Venezuela has been considering LNG exports with different projects that, so far, didn’t go ahead, despite the huge gas reserves of the country.*

# *Dominican Republic and Puerto Rico are the only countries in the area with installed regas capacity: 1,9 Mtpa in Andrés (Dominican Republic) and 1,8 Mtpa in Peñuelas (Puerto Rico); both terminals receive LNG supply mainly from T&T and don’t have a real open access regime. The main driver for this gas consumption is power generation.*

*Several countries within the region have showed a big interest on incorporating the LNG within their energy matrix. Notwithstanding, despite the interest for the LNG, there’s not a significant rise in the regas capacity in the area so far.*

# Analysis of regional data

*There are, currently, under different stages of development, some new potential small scale projects in the area. Mainly balanced to consumption (regas):*

* ***Small LNG Consumption panorama****:*
1. *The Caribbean&Central America potential consumption markets have a strong potential for small scale LNG developments.* ***Main Drivers****:*
	* ***Apetite for gas*** *as alternative fuel with respect oil related products (price, efficiency, environment)*
	* *The* ***distance*** *of most of the potential consumptions (many islands) in the area with* ***respect the potential gas supplies make the LNG as the main logistics alternative*** *with respect any pipeline approach.*
		+ *For having access to international LNG supplies (out of the area), these markets would* ***have to compete, in terms of price, with other international (and traditional) big LNG consumers.***
		+ ***Small and discretized (non-connected) consumptions,*** *only some countries can achieve an aggregated potential consumption for base load regas terminals. This makes that small scale projects, if technical and economically feasible, fit with the size of most of the potential consumptions.*
		+ *In some cases the related consumptions have a strong* ***seasonal component****.*
		+ ***Power generation is one of main drivers*** *for gas consumption (fuel switching). Some countries don’t have an easy power interconnection, so specific regas facilities are required for specific power developments (limited demand aggregation potential)*
		+ ***Other main potential consumers are raw industries*** *(e.g. mining) frequently located far from transport lines (both gas or power generation) and therefore requiring an specific import facility for fitting their consumption with limited aggregation capacity.*
		+ *Many projects announced, many potential consumers willing to develop small LNG developments but* ***challenges for progressing with those projects: unit costs, securing financing and securing LNG supply (that require long term commitments*** *and therefore balance sheet capabilities)****.***
		+ *In many cases, the potential LNG consumers* ***try to involve experienced LNG companies to provide an integrated solution,*** *both in terms of:*
			- *Ability and experience for regas facilities design, construction and operation (and also financial strength)*
			- *Securing the required LNG supply.*
2. ***Key players****:*
	* + *For* ***securing consumption****:* ***Utilities*** *(power generators),* ***Mining companies*** *(extraction&treatment) and many times* ***National Companies*** *(power generation and/or distribution) that try to aggregate different consumptions.*
		+ *For* ***implementing the required regas infrastructures****:*
			- *The* ***regas technologies*** *usually involved in this kind of projects make use of e relatively* ***tested*** *(peak shaving, satellite LNG plants)* ***existing ones*** *with their main recognized providers.*
			- *In many cases the promoters issue* ***tenders for construction&operation*** *companies bringing both the technical expertise and financing capacities (on a build own operate business model –BOO-). In some cases the requirement is done altogether with the construction of the envisaged consumption facility (power generation). Both onshore and offshore.*
			- ***Fast track solutions*** *are usually required for matching short term demand; this potential for smals scale FSRUs.*
			- *For* ***LNG supply****:*
			- *Most of the current LNG supplies from the area (T&T) are already committed to long term contracts.*
			- *Many consumption projects look at the* ***US developments*** *as their “natural” LNG supplier. Notwithstanding, these US developments have the opportunity to achieve the international premium markets with conventional carriers.*
			- *Some projects make international supply tenders and receive offers from* ***international LNG operators*** *that have capabilities for supplying the alternative premium markets.*
			- *Attracting* ***LNG volumes from international LNG markets require “conventional size” LNG carriers*** *sizes; therefore the risk of sub optimization of receiving terminals is not negligible.*
			- *Currently, there’s only a potential “small scale” supplier with FID in the area (Pacific Rubiales). This facility would also be prepared as to be reversed for regas purposes if required.*
	* ***Small LNG production&transport panorama****:*
3. ***Main Drivers****:*
* ***Monetization of small-medium scale gas resources:***
	+ - * + *Without a clear access to domestic consumptions.*
				+ *Without “critical mass” as to be processed or aggregated in conventional “base load” (3+ Mtpa) LNG developments.*
* *Requirement for* ***innovative configurations*** *as to* ***overcome des-economy of scale****. At the same time, try to maximize the use of* ***proven small scale liquefaction modules*** *(expertise from peak shaving facilities) for reliability. In this sense, the offshore solutions both on a hull or on a barge, appear to be the ones with most chances to provide the capex optimization required.*
* ***The only small scale liquefaction project currently sanctioned*** *(0,5 Mtpa Pacific Rubiales in Colombia) is* ***an offshore development,*** *probably because of cost efficiency with respect onshore.*
* ***Markets flexibility****: although there are other logistics alternatives for small scale gas production, such as CNG, the LNG provides access to many markets (including the long distance premium ones) with ability for diversions.*
* *Ability for making use of both* ***conventional size carriers*** *(international markets) and* ***smaller scale ones*** *(regional markets)*
1. ***Key players****:*
	* ***Upstream (feedgas):***
		+ *Independent E&P companies with, “stranded” gas resources, in terms of conventional size LNG developments, and with appetite for new concepts (such as Pacific Rubiales in Colombia) or with some aggregation capabilities from small producers.*
		+ *Companies with some abilities and interests for aggregating spare production and for developing regional LNG markets with customized solutions.*
	* ***Liquefaction (facilities):***
	* ***Technology providers*** *with experience in small scale liquefaction developments and providing “proven” solutions in other market niches (peak shaving, floating LNG solutions).*
	* ***“Integrators”:*** *companies that put together liquefaction technology providers, shipyards and integrally develop the project under a BOO (build own and operate) business model.*
	* ***Shipping:***
	* *Shipowners with experience and/or innovative solutions for small – mid scale shipping (<40.000 m3 LNG) and with conventional size carriers.*

# Safety, standards and regulations

* + - *In general terms, most of the countries with potential projects don’t have a specific regulation for LNG receiving terminals. In order to attract investors for developing receiving terminals the regulatory framework needs to be defined. Notwithstanding, many of the projects under study count with those countries authorities’ support.*
		- *In Dominican Republic and Puerto Rico with already existing LNG receiving terminals the main regulatory issue is that there are not open access, this makes that other potential LNG consumers don’t have the possibility to access LNG except by developing their own receiving facility.*
		- *The only small scale project already sanctioned in the area, Pacific Rubiales in Colombia (exporting, but also potentially importing facility), is subject to the gas regulatory framework led by the Ministry and CREG (domestic energy agency). The gas regulatory framework in Colombia sets, as mandatory, that the national gas supply/demand projections are positive for at least the following 8 years in order to allow gas exports.*
* *To be completed with additional safety/standards information if finally achievable*

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# Conclusions

* *The Caribbean/Central America area is a clear niche for small scale LNG developments, mainly for regas/consumption purposes, due to two main characteristics:*
	+ *Abundance of small size (and isolated) markets*
	+ *Potential premium prices as LNG would substitute other oil related fuels*
* *The main challenges for the development of the small scale projects are:*
	+ *Des-economy of scale. The technology/configuration improvements related to reduce unit cost are key.*
	+ *Financing/long term commitments for small size companies.*
	+ *Securing LNG supplies being competitive with other premium markets.*
1. Data Collection from the Regions

Please include the excel data collection template



1. Small Scale LNG : Drivers and Business Models

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Type of Project**  | **Definition**  | **Challenges** | **Drivers, Purpose\***  | **Business Model\*\***  | **Examples** |
| Liquefaction  | Production of LNG with capacity lower than 1mtpa  |  Overall cost optimization to overcome des-economy of scale |  Commercialize gas through LNG (markets flexibility) and put in value stranded gas resources as per traditional baseload LNG facilities |  Tolling of liquefaction facilities through BOO business model. Facilities developed, constructed and operated by a Company in exchange of a time charter fee to be satisfied by the gas producer. |  Pacific Rubiales (Colombia) |
| Break Bulk Infrastructure | Receives LNG (e.g. shipping) and breaks down the LNG into smaller quantities for further distribution to marine bunkering and truck fuelling stations. Also ship to ship transfer viable.  |   |   |   |   |
| Marine Distribution/Milk Run | Effective gas supply solution for thescattered islands or coastal areas, where the other transportation modes are not economically viable or the infrastucture is not present.Milk Run is characterised by partial unloading to multiple locations |   | \* Relatively low gas demand does not justify the high capital investment costs for pipelines |   | \* Eastern Indonesia\* Caribbean islands\* Coasts of Japan and Norway |
| Infrastructure for Inland Distribution  | Trucking/Shipping/Rail of LNG to inland satellite stations |   |   |   | \* China\* Spain  |
| Peak Shaving  | LNG peak shaving facility can be chosen to supply the incremental natural gas required to meet the demands peak demands for example, where the pipeline netweork is already fully utilised for normal demand, in remote areas far from NG resources, or where geology which prevents the development of underground gas storage.  |   |   |   | \* Mount Hayes LNG Peak shaving Facility - British Columbia (Vancouver Island) |
| Small Scale FloatingLNG | Offshore LNG production lower than 1 mtpa– Offshore stranded gas field– Associated gas available from offshore oil field– Near shore location to liquefy country excess gas or shale gas |   Overall cost optimization to overcome des-economy of scale |  Commercialize gas through LNG (markets flexibility) and put in value stranded gas resources as per traditional baseload LNG facilities |  Tolling of liquefaction facilities through BOO business model. Facilities developed, constructed and operated by a Company in exchange of a time charter fee to be satisfied by the gas producer. | Total & Technip presentation at LNG17\* Canadian Douglas channel project\* Rubiales LNG in Columbia  |
| Small Scale Regas | Facility regassing LNG with less than 1mpta capacity. Various locations and sources of LNG can be considered.  |   |   |   | \* Sweden - Linde Project \*  |
| …  |   |   |   |   |   |