Gas Infrastructure Europe

Market development: Improvements in LNG market design

Jacques Rottenberg
GLE Vice-President

CEER Workshop on LNG, Athens, 12 September 2016

GIE association of infrastructure operators

- **actively contributes to the construction of a single, sustainable and competitive gas market in Europe**
  - Participation to workshops, consultations …..

- **Is in particular continuously working on offering and improving tools for the market**
  - ✓ Developed on a voluntary basis
  - ✓ Easy and friendly access
  - ✓ Designed for Professionals
  - ✓ Offered free of charge

GLE Transparency Template

Facilitating tool **common** to all LSOs

- ✓ making the already existing information in LSOs websites easily accessible
- ✓ enabling shippers to get quickly the necessary information regarding access to LNG terminals

Designed in cooperation with CEER

	Macro Area	Submenu
1	CONTACT	Contact
2	TERMINAL CHARACTERISTICS	Facilities main characteristics
		Service Description
		LNG Quality
3	HOW TO BECOME A CUSTOMER / USER	Main steps for applying for access
		Contract information
		TSO information
		Ship procedures
4	CAPACITIES	Primary market
		Secondary market
5	TARIFF	Regulated terminals
		Exempted terminals
6	LEGAL DOCUMENTATION	Contracts/Codes
		Regulation/Legislation
7	OPERATIONAL DATA	Historical data
		Operational data
8	MISCELLANEOUS	Projects

Other GLE Transparency tools

Publication of maps and data

⇒ providing aggregated / detailed information about LNG terminals and their use : location, characteristics, services offered, utilization data…

⇒ allowing professionals to have a clear overview on LNG facilities and LNG use in Europe

- ✓ Maps of LNG terminals (updated yearly)
- ✓ Small scale LNG map (updated yearly)
- ✓ Investment data base (updated yearly)
- ✓ ALSI : **daily** send-outs and inventories per country and **per terminal**, with on line history and graphs

New

- ✓ New services inventory : reloading, transshipment, loading of bunkering ships, truck loading, … (updated yearly)

GLE Transparency tools example

Gas LNG Europe

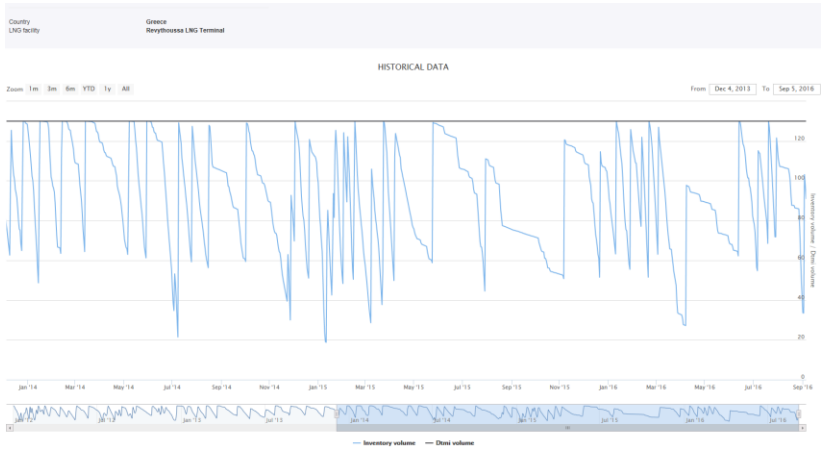
LE Investment Database @ revision April 2015 * *** GLE Investment Database @ revision A**

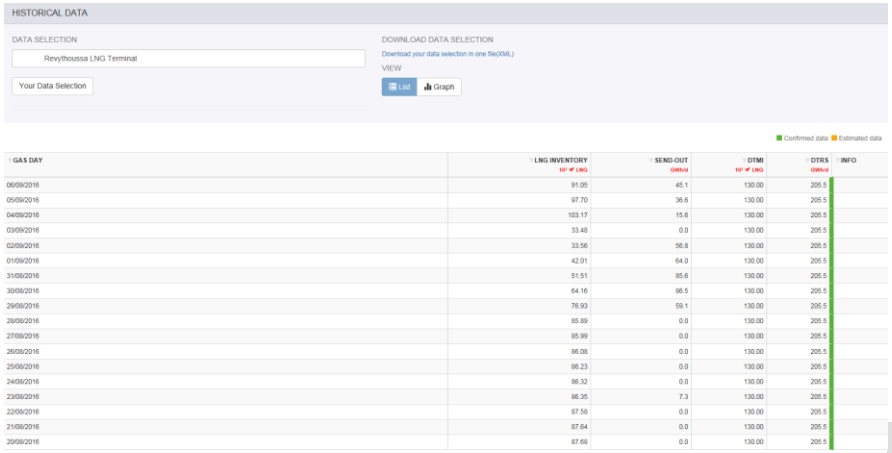
Country	Facility	Operator	2013	2014		2015		2016		2017		2018		2019		2020		2021		
			m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	billion m³	m³ LNG	bill
Belgium	Zeebrugge LNG Term	FLUXYS LNG	380 000	9	380 000	9	380 000	9	380 000	9	380 000	9	380 000	9	380 000	9	380 000	9	380 000	
France	Fos-Tonkin LNG Term	Elengy	150 000	5,5	150 000	3,4	150 000	3,4	150 000	3,4	150 000	3,4	150 000	3,4	150 000	3,4	150 000	3,4	150 000	3
France	Montoir-de-Bretagne	Elengy	360 000	10	360 000	10	360 000	10	360 000	10	360 000	10	360 000	10	360 000	10	360 000	10	360 000	1
France	Fos Cavaou LNG Ter	Fosmax LNG	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,25	330 000	8,
Greece	Revithoussa	DESFA	130 000	5,3	130 000	5	130 000	5	130 000	5	130 000	5	130 000	5	130 000	5	130 000	5	130 000	
Italy	Panigaglia LNG termin	GNL Italia	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3,4	100 000	3
Italy	Porto Levante LNG te	Adriatic LNG	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,56	250 000	7,
Italy	FSRU OLT Offshore L	OLT Offshore LNG Tosca	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,75	135 000	3,
Lithuania	FSRU Independence	Klaipedos Nafta		4	170 000	4	170 000	4	170 000	4	170 000	4	170 000	4	170 000	4	170 000	4	170 000	
Netherlands	Gate terminal, Rotterd	Gate terminal	540 000	12	540 000	12	540 000	12	540 000	12	540 000	12	540 000	12	540 000	12	540 000	12	540 000	1
Norway	Mosjoen LNG termina	Gasnor	6 500		6 500		6 500		6 500		6 500		6 500		6 500		6 500		6 500	
Norway	Øra LNG, Fredrikstad	SkanGas	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,15	6 500	0,
Portugal	Sines LNG Terminal	REN Atlantico	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7,9	390 000	7
Spain	Barcelona LNG Termi	Enagás	840 000	17,1	760 000	17,1	760 000	17,1	760 000	17,1	760 000	17,1	760 000	17,1	760 000	17,1	760 000	17,1	760 000	17
Spain	Huelva LNG Terminal	Enagás	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11,8	619 500	11
Spain	Cartagena LNG Termi	Enagás	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11,8	587 000	11
Spain	Bilbao LNG terminal	BBG	300 000	7	450 000	8,8	450 000	8,8	450 000	8,8	450 000	8,8	450 000	8,8	450 000	8,8	450 000	8,8	450 000	8
Spain	Sagunto LNG termina	Saggas	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8,8	600 000	8
Spain	Mugardos LNG Termi	Reganosa	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3,6	300 000	3
Spain	Gijón (Musel) LNG ter	Enagás		7	300 000	7	300 000	7	300 000	7	300 000	7	300 000	7	300 000	7	300 000	7	300 000	
Sweden	Nynäshamn LNG term	AGA	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0,5	20 000	0
Sweden	Lysekil LNG Terminal	SkanGas		0,3	30 000	0,3	30 000	0,3	30 000	0,3	30 000	0,3	30 000	0,3	30 000	0,3	30 000	0,3	30 000	0
Turkey	Marmara Ereglisi LNG	BOTAS	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6,2	255 000	6
Turkey	Aliaga Izmir LNG Ter	EgeGaz	280 000	6	280 000	6	280 000	6	280 000	6	280 000	6	280 000	6	280 000	6	280 000	6	280 000	
UK	Isle of Grain LNG ter	Grain LNG	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19,5	1 000 000	19
UK	Milford Haven - Drago	Dragon LNG	775 000	21	775 000	21	775 000	21	775 000	21	775 000	21	775 000	21	775 000	21	775 000	21	775 000	2
UK	Milford Haven - South	South Hook LNG	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7,6	320 000	7

	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	billion m³	million m³ LNG	bill
EU-28 large-scale																		
planned				0	0,0	5	0,2	16	0,5	46	1,7	80	3,2	106	4,8	114	5,3	1
under construction				13	0,6	7	0,4	1	0,2	1	0,2	0	0,0	0	0,0	0	0,0	
operational	8,1	196	8,6	191	8,6	204	9,2	211	9,6	213	9,8	214	9,9	214	9,9	214	9,9	2
Europe large-scale																		
planned				5	0,0	10	0,2	21	0,5	64	1,9	98	3,4	124	5,0	132	5,5	1
under construction				13	0,6	7	0,4	1	0,2	1	0,2							
operational	8,6	208	9,2	203	9,2	216	9,8	223	10,2	225	10,3	226	10,5	226	10,5	226	10,5	2

GLE Transparency tools example

GAS DAY STARTED ON 07/09/2016 - 06:00:00 CET	LNG INVENTORY 10³ m³ LNG	SEND-OUT GWh/d	DTMI 10³ m³ LNG	DTRS GWh/d	VIEW
Europe	2849.90	1365.1	7167.91	5606.5	History Graph
Belgium	176.34	21.9	374.00	444.5	History Graph
France	354.44	195.7	770.00	698.6	History Graph
Greece	91.05	45.1	130.00	205.5	History Graph
Italy	184.00	223.8	177.16	514.5	History Graph
Adriatic LNG	159.39	223.6	0.00	228.5	History Graph
Adriatic LNG Terminal	159.39	223.6	0.00	228.5	History Graph
GNL Italia	24.61	0.2	40.00	119.5	History Graph
Panigaglia LNG Terminal	24.61	0.2	40.00	119.5	History Graph
OLT Offshore LNG Toscana	0.00	0.0	137.16	166.5	History Graph
FSRU OLT Offshore LNG Toscana	0.00	0.0	137.16	166.5	History Graph
Lithuania	-	-	-	-	History Graph
Netherlands	131.33	4.9	540.00	461.0	History Graph
Poland	-	-	-	-	History Graph
Portugal	121.56	47.7	390.00	192.8	History Graph
Spain	878.04	243.0	3008.68	1795.5	History Graph
United Kingdom	913.16	583.0	1778.08	1294.0	History Graph
Non-EU	-	-	-	-	History Graph





GLE Transparency tools example

New LNG Services Inventory

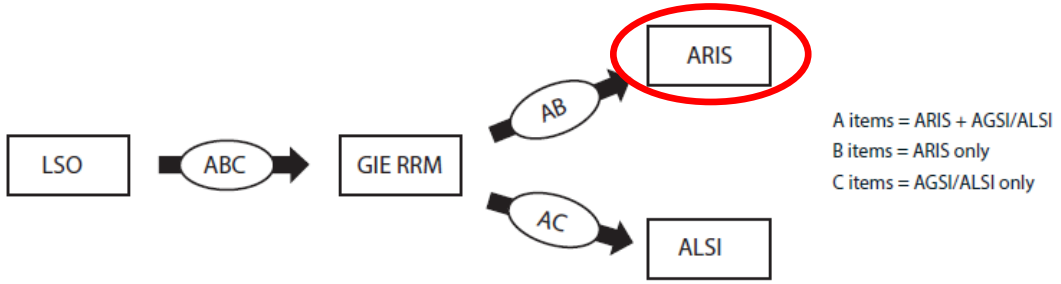
Country	Belgium	France	France	France	France	Greece	Italy	Italy	Italy	Lithuania	The Netherlands	Poland	Portugal	Spain	Spain	Spain	Spain	Spain	Spain	Spain	United Kingdom	United Kingdom	United Kingdom
Company	Fluxys	Dunkerque LNG	Elengy	Elengy	Fosmax LNG	DESFA	ADRIATIC	GNL Italia	OLT Offshore	Klaipedos	Gasunie	GAZ-System	REN	BBG	Enagas	Enagas	Enagas	Enagas	Reganosa	Saggas	Dragon LNG	Grain LNG	South Hook
Facility	Zeebrugge	Dunkerque	Montoir de Bretagne	Fos Tonkin	Fos Cavaou	Revithoussa	Porto Viro	Panigaglia	LNG Toscana	Independence	Gate	Swinoujscie	Sines	Bilbao	Barcelona	Cartagena	Huelva	El Musel	Mugardos	Sagunto	Milford	Isle of Grain	Milford
2011 No.	10	available from start-up of terminal operation in 2016	-	started in 2013	-					available from 2015	start mid 2013		-			7	7		3				
2011 m³LNG	1 299 000		-		-								-			200 000	271 000		579 609				
2012 No.	25		4		1								1			14	16		12				
2012 m³LNG	3 004 000		420 000		100 000								122 203			1 530 000	1 236 000		519 606				
2013 No.	21		2	0	8						8		6			6	14		16	10			
2013 m³LNG	2 529 000		200 000	0	740 000						457 007		670 003			603 000	1 664 000		520 964	1 000 605			
2014 No.	19		4	0	4						20		6	0	3	18	17		12	20		1	
2014 m³LNG	2 432 000		460 000	0	520 000						911 200		527 065	0	340 007	2 340 045	2 236 606		1 015 350	2 020 039		125 000	
2015 No.	20		4	0	4					0	20		4	4	3	1	6		5	10		3	
2015 m³LNG	1 029 000		470 000	0	510 000					0	1 070 697		527 576	445 517	352 130	161 704	467 515		12 124	311 763		456 251	
Transhipment	yes	no	yes	no	yes	no	no	no	no	no	yes	no	no	no	no	yes	no	no	no	no	no	yes	no
min. ship size: m³LNG	2 000		20 000		15 000						5 000	[illegible] under study				7 500		[illegible] under study	[illegible] under study			60 000	
Capacity (LNG)	14 000		5 000		4 500						10 000					1 000						n.a.	
comment			[illegible] to 14,000 m³ 2017																			ship dependent	
2013 No.	available from 2016		3								start in 2H2015					0							
2013 m³LNG			370 000													0							
2014 No.			1													0						0	
2014 m³LNG			150 000													0						0	
2015 No.			0								0					0						0	
2015 m³LNG			0								0					0						0	
Loading of bunkering	yes	no	yes	yes	yes	no	no	no	no	no	yes	no	no	no	no	no	no	no	yes	no	no	no	no
min. ship size: m³LNG	7 000	[illegible] under study	20 000	7 500	15 000	[illegible] under study for vessels as small as 1,000 m³		Feasibility study in progress; FID expected by the end of 2016	Feasibility study completed in 2015	[illegible] available from 2017, EPC contract is signed	5 000	[illegible] under study		600	[illegible] under development	[illegible] under study	[illegible] under study	[illegible] under study	7 500	[illegible] under study		2 000	
comment	3000 [illegible] 2016		[illegible]	[illegible]	[illegible]						[illegible] 2H2016			[illegible]									
Capacity (LNG)	5 000		4 000	1 000	4 000						3 500			1 000					2 000			available from 2016/17	
comment											[illegible]												
2011 No.	0		-	started in 2013	-														0				
2011 m³LNG	0		-		-														0				
2012 No.	1		0		0														0				
2012 m³LNG	7 500		0		0														0				
2013 No.	0		0	0	0						0								0				
2013 m³LNG	0		0	0	0						0								0				
2014 No.	0		0	0	0						0								0				
2014 m³LNG	0		0	0	0						0								0				
2015 No.	17		0	0	0						0								0				
2015 m³LNG	245 000		0	0	0						0								0				
Truck	yes	no	yes	yes	yes	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no
Capacity (LNG) m³/h	75	[illegible] under study	1 x 100	1 x 100	-	1 x 100		Feasibility study in progress; FID expected by the end of 2016		[illegible] available from 2017, EPC contract is signed	1 x 100	2 (+1) x 30	2 x 50, 1 x 75	2x27	3 x 31	3 x 31	3 x 31	3 x 31	2 x 75	2 x 70		2 x 80	
comment		2 x 100 [illegible]	3 x 100 [illegible]	2 x 100 [illegible]	[illegible] Tonkin	[illegible] 2017					[illegible]												
2011 No.	65		started in 2013	started in 2014							as from beginning 2014	available from 3Q2016	2 699	unavailable from Dec 2010 to Mar 2014	10 541	10 102	15 462		3 422	4 600		available	
2011 m³LNG	2 240												105 500		526 000	506 000	774 000		199 000	207 160			
2012 No.	316												2 560		9 710	9 764	16 604		4 429	4 260			
2012 m³LNG	10 530												102 754		486 000	489 000	835 000		190 300	180 630			
2013 No.	819		49										3 490		9 409	9 895	9 082		6 299	4 579			
2013 m³LNG	32 000		2 000										141 356		415 000	396 000	499 000		282 100	199 967			
2014 No.	1 670		424	10							174		4 260	50	6 440	7 077	8 167		9 729	4 563			
2014 m³LNG	66 100		21 200	300							7 099		184 423	2 450	270 255	311 710	359 550		436 000	200 296			
2015 No.	1 104		1 149	335							700		4 676	1 095	6 576	7 560	8 701		7 022	4 705		49	
2015 m³LNG	46 000		52 000	16 000							30 400		197 665	44 574	286 404	335 204	382 002		311 492	217 054		1 814	
Rail	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
Comment			Under study acc. to market interest (railway available)	Under study acc. to market interest (railway available)							under study	under study			under study							rail connection available	

Services under REMIT

REMIT: regulation **aiming at reducing risk of manipulation**

- ✓ information related to the capacity and use of LNG facilities, including planned or unplanned unavailability of these facilities ('fundamental data') should be reported to ACER
- ✓ GIE has worked closely with ACER to develop reporting schemes
- ✓ GIE has registered as RRM (Registered Reporting Mechanism) with ARIS, the ACER REMIT Information System

⇒ **GIE facilitates the reporting of fundamental data for LSOs to ACER and stays in close contact with ACER for any questions**



Conclusions

GIE / GLE

⇒ **Contribution to gas/LNG market design**

⇒ **Tools for transparency and reporting**

⇒ **Open to discussion on any further improvements**

GIE is proud to support

gas naturally

making a clean future real

Gas Naturally

GN is a campaign to showcase the essential role of natural gas in the forthcoming energy revolution. The mitigation of climate change has become one of the most important issues for the gas industry.

Thank you
for your kind attention.

GIE - Gas Infrastructure Europe
www.gie.eu