

73nd TSG Meeting WG related to CO2 emissions



APRIL 2023



From previous TSG Meeting

Decisions were as follows:

- Shell joins the Task Force on CO₂ Emissions from LNG terminals. The Task Force members are: Dunkerque LNG (Task Force Leader), Enagas, Engie, Semptra Infrastructure, Shell and TotalEnergies.
- The Task Force on CO₂ Emissions from LNG terminals will collect examples from GIIGNL members, set-up a questionnaire and submit it. Mr Planteline (Task Force Leader) will make a presentation at next TSG meeting for sharing the results.
- A Task Force is constituted on LCO₂ terminalling with the following members: Singapore LNG (Task Force Leader), Dunkerque LNG, Elengy, Engie, Equinor, Fluxys LNG, Osaka Gas, Semptra, Shell and TotalEnergies.
- Mrs. Ang (Task Force Leader) will prepare a scope of work on LCO₂ terminalling and will present it at next TSG meeting.



Progress

- Questionnaire not submitted prior this TSG meeting 😞
- Draft questionnaire submitted here for quick review.
- Draft questionnaire integrating your first impressions to be sent to all WG members following this TSG meeting for detailed review.
- Once approved by WG members, submit to Central office for set-up under google form and diffusion to all members like other questionnaire.
- Presentation of results during 74th TSG meeting



Questionnaire objectives

- Draft questionnaire divided in 6 parts:
- Part 1 is related to methodology. Purpose is to assess where do we stand collectively as of today in carbon accounting and to look at specific points we all face when starting this assessment.
- Part 2 is related to Reporting. Purpose is to assess what are general reporting obligations LNG terminals are facing as of today.
- Part 3 is related to reduction Action Plan which follows usually the carbon footprint assessment. Purpose is to assess where do we stand collectively.
- Part 4 / 5 / 6 are respectively related to Scope 1 / 2 / 3 emissions. Purpose is to assess the share of each scope in terminal global emissions and the reduction actions identified or already conducted. Goal is to identify which members are already ready to share return of experience of some reduction actions conducted in their terminal.



Draft Table of Content

- **Proposal for discussion**
- Scope 1/2/3 to be covered ?
- Other examples ?
- Minimum number of case studies for the final report ?
- Sufficient real cases existing for the time being ?
- Case study presentation might follow the same template used for terminal and PP integration

Introduction	
<ul style="list-style-type: none"> > General context > Source of main CO2 emissions inside a regasification terminal > Extent of CO2 emissions per main equipment and scope 	
I-Ways to reduce CO2 emissions	
1.1)Scope 1 emissions	
> Flaring	<ul style="list-style-type: none"> > H2 pilot flare > Pilot on demand flare retrofit >...
> Maintenance flaring	<ul style="list-style-type: none"> > Rental of temporary Pipeline Compressors >...
> Vaporizers (SCV, S&T, IFV..)	<ul style="list-style-type: none"> > ORV installations in "cold" sea water area > Solar panels to warm SW > H2 burners > Carbon Capture from SCV Flue gas > FSRU : Warm SW from steam condenser, NG Trim heaters,... >...
> Other scope 1 emission (to be listed)	>...
1.2) Scope 2 emissions	
<ul style="list-style-type: none"> > VSD installations > BOG / HP LNG Exchanger > Operation adjustment during peak hours > Renewable energy facilities on terminal > Smart building and lighting management system (LED, AC...) > Others (recent examples of thermal integration) 	
1.3) Scope 3 emissions	
<ul style="list-style-type: none"> > Site electric vehicles for O&M personnel > Others 	
II-LNG terminal concrete examples	
Case Study #1 Case Study #2 Case Study #3 ...	



Case Study Presentation

When information was obtained, **integration origins**, **process overview**, some **elements of costs**, **generated benefits** and **return of experience** are provided.

Recap table: LNG terminal & synergy

Logotype of the synergy
Same as in 6th part

Operating parameters: LNG terminal & synergy

Scheme of working principle: for both LNG terminal and power plant, **only necessary to understand the synergy principle** units are represented.

8. LNG terminals experience

Hol: Montoir-de-Bretagne



Integration origins

In 2010, a combined cycle power plant was built near the LNG terminal.

The French government already encouraged industrials to be more environmentally-friendly. Thus, to reduce their environmental footprints and enhance their industrial performances at the same time, both industrials thought to share a water circuit to recover waste heat from power plant for LNG regasification process.

The synergy was finally imposed by the local authorities (DREAL) as a condition for building the power plant.

Process overview

Parameters	Values	Units
LNG terminal		
Nominal capacity	10	bcm/y
Availability	(80%) 7,000	t/y
Regasification pressure	80	bar
LNG flow rate/vaporizer	0 to 250	t/h
Usual Loire T°	12	°C
Water T° decrease	5 to 7	°C
Power Plant		
Availability	5,000	t/y
Power output	435	MW
Seawater flow rate	30,000	t/h
Water T° increase	5 to 7	°C

Terminal	Montoir-de-Bretagne	System	CCGT	2010
Owner	Energy	Power plant type	CCGT	
Country	France	Implementation	Outside	



As shown on Figure 8.1, water is pumped from the Loire river by the power plant, used to cool its process and sent to a basin on LNG terminal site. Hot water then goes to pumping unit through gravity action, is pumped to ORVs and finally released in the Loire river.

Technically, power plant can run separately but is contractually only allowed to operate if it makes its hot water available for the LNG terminal.

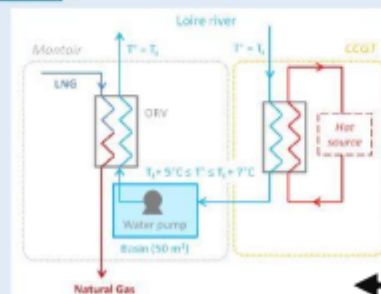


Figure 8.1 – Working principle of Montoir-de-Bretagne Hol synergy



LNG import terminal and Power integration | 2013 - 2014



WG members

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DUNKERQUE LNG	Sylvain PLANTELIN	s.planteline@dunkerqueLNG.com
ENAGAS		
ENGIE		
SEMPRA INFRASTRUCTURES		
SHELL		
TOTALENERGIES		



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Shaping together a bright energy future