KUALA LUMPUR 2012 WORLD GAS CONFERENCE

25th world gas conference

"Gas: Sustaining Future Global Growth"

Dunkerque LNG 13 Bcma regasification terminal

Creative solutions for the development of a new major European LNG infrastructure

Christophe LIAUD, Commercial Director

7 June 2012

Kuala Lumpur Convention Center

Patron

IGU
INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ

Host

MALAYSIAN Gas ASSOCIATION

Host Sponsor

PETRONAS

Dunkerque LNG: an investment decision for the largest regasification terminal in continental Europe

- **EDF group: 1st electric utility in Europe and the world's leading nuclear power plant operator**
  - **58 reactors in France**
  - **15 reactors in UK**
  - **5 reactors in USA**
  - **3 EPR reactors being built**

- **After 5-year of development, EDF decided to invest 1 G€ for the construction of a 13 Bcma regasification terminal together with 2 prestigious industrial partners**

	EDF	Total	Fluxys	Available
Equity	65%	10%	25%	/
Capacity	8 Bcma	2 Bcma	0 Bcma	3 Bcma

WHY?

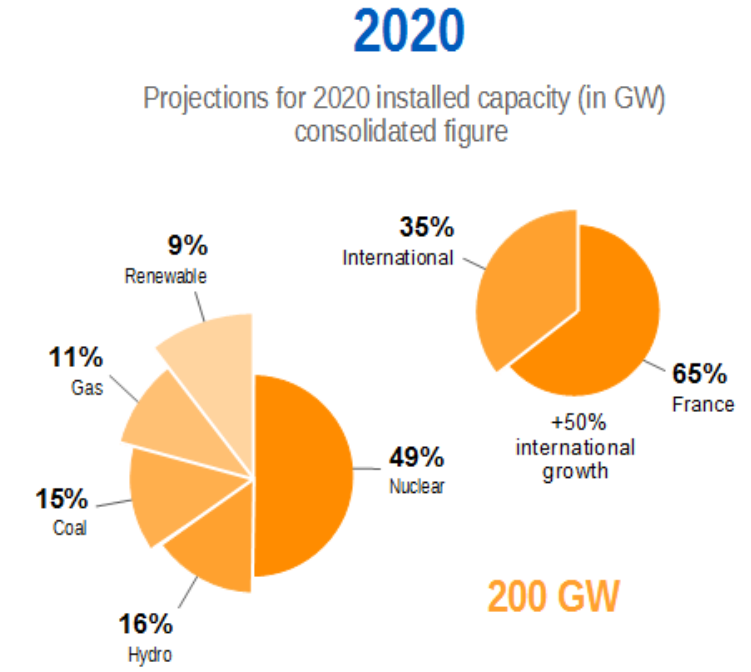
Why? To secure a competitive and flexible gas supply for the EDF group

- **2020 EDF Group's objective: a fleet of 200 GW of installed capacity, 75% carbon-free**

- **CCGT technology combines**
  - **Energy efficiency**
  - **Low investment costs**
  - **Short construction time**

- **22 GW gas fired power plants in 2020**
  - **The gas as an alternative to more fossil fuel carbon power production means**
  - **The gas to mitigate renewables intermittency**
  - **The gas as the prefered fuel in some countries**

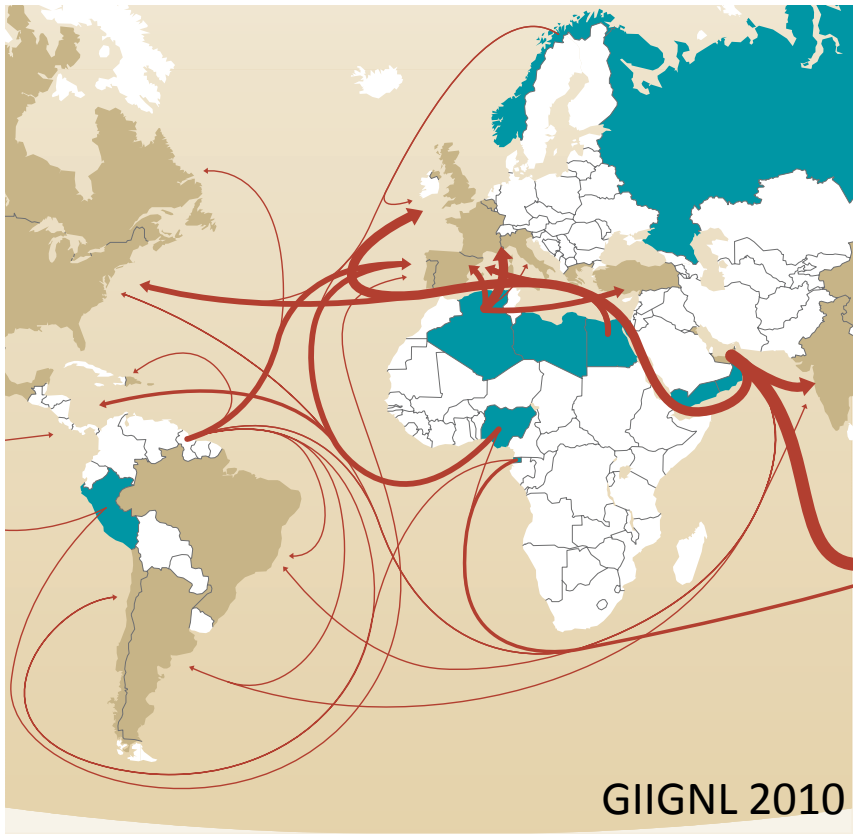
- **Gas supply to end-users**
  - **2012 EDF group gas sales: 103 TWh**



Why?

Dunkerque LNG regasification terminal: an arm of the EDF group's gas strategy

- **Decline of indigenous gas production sources**
- **Distance of supply sources**
- **Liberalization of European gas market under construction**
- **Limited gas transport capacities**
- **Shale gas in US**
- **Nuclear policy**



➔ Necessity for **new-comers** to develop their own tools and have **access to logistical infrastructures** for ensuring **competitive and flexible deliveries**

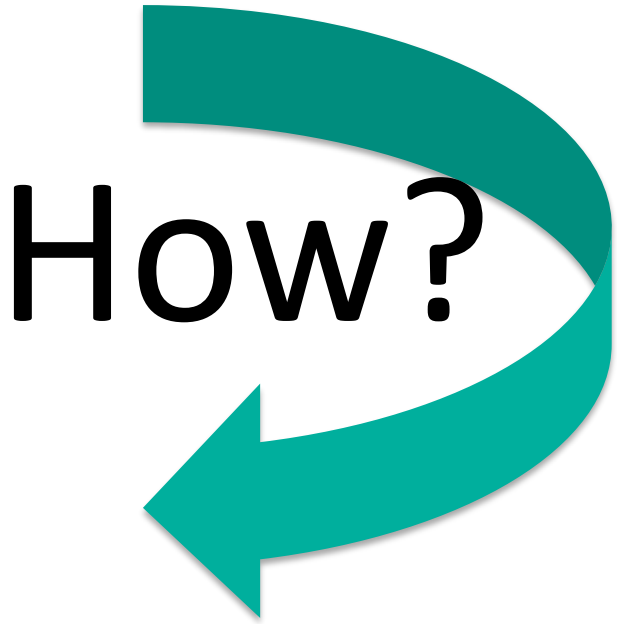
➔ **Decision of EDF to develop a green-field 13 Bcma LNG terminal** in the context of the economic and financial crisis

WHAT?

What? A terminal designed to fulfill LNG shippers in Europe requirements

Throughput capacity	LNG working storage capacity	Berth	Send-out rates range
13 bcm/y (# 9.2 mtpa)	**3 tanks of 190,000 m3 570,000 m³ total**	**1**	~0 – 1,9 Mm3/h

As the **largest contiental Europe regazification terminal**, Dunkerque LNG has the capacity to process **20 % of the France and Belgium total gas demand** and helps ensure **North WEst Europe security of supply**


How?

How?

Environmental, social and local acceptability

- The choice of the industrial Port of Dunkirk as project owner for the realization of maritime infrastructures

+

- The strong support of the local authorities that decided to take advantage of the project to achieve the local industrial development

+

- The modification of the lay-out to avoid major sensitive areas for biodiversity

+

- The decision to build a zero GHG emission terminal

=

A strong local acceptability of the project

All the environmental permits and operation authorisations, usual major project hurdles, have been obtained smoothly

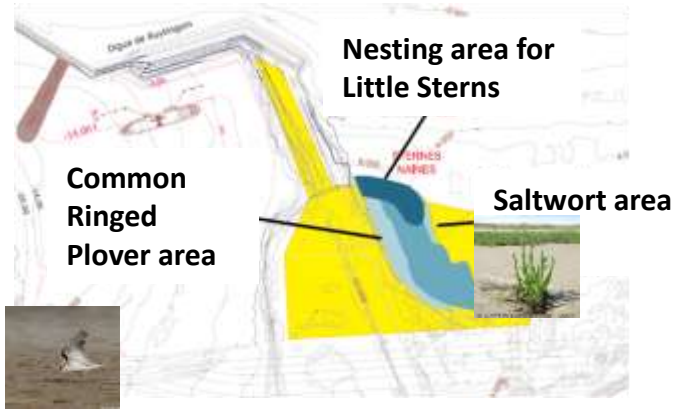
How?

Environmental, social and local acceptability

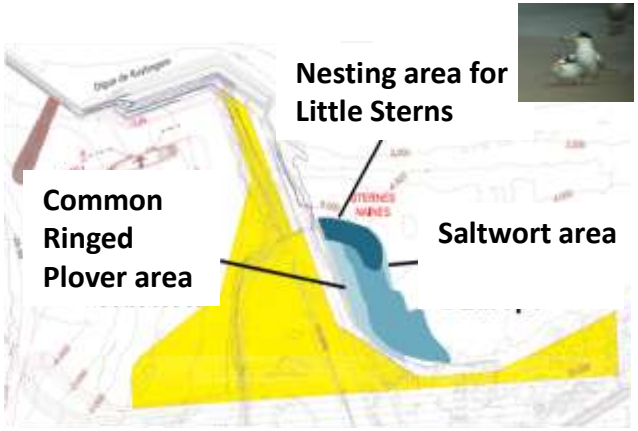
Focus on the modification of the layout

- Evolution of the terminal boundaries

Initial Project (April 2007)



Final Project (April 2008)

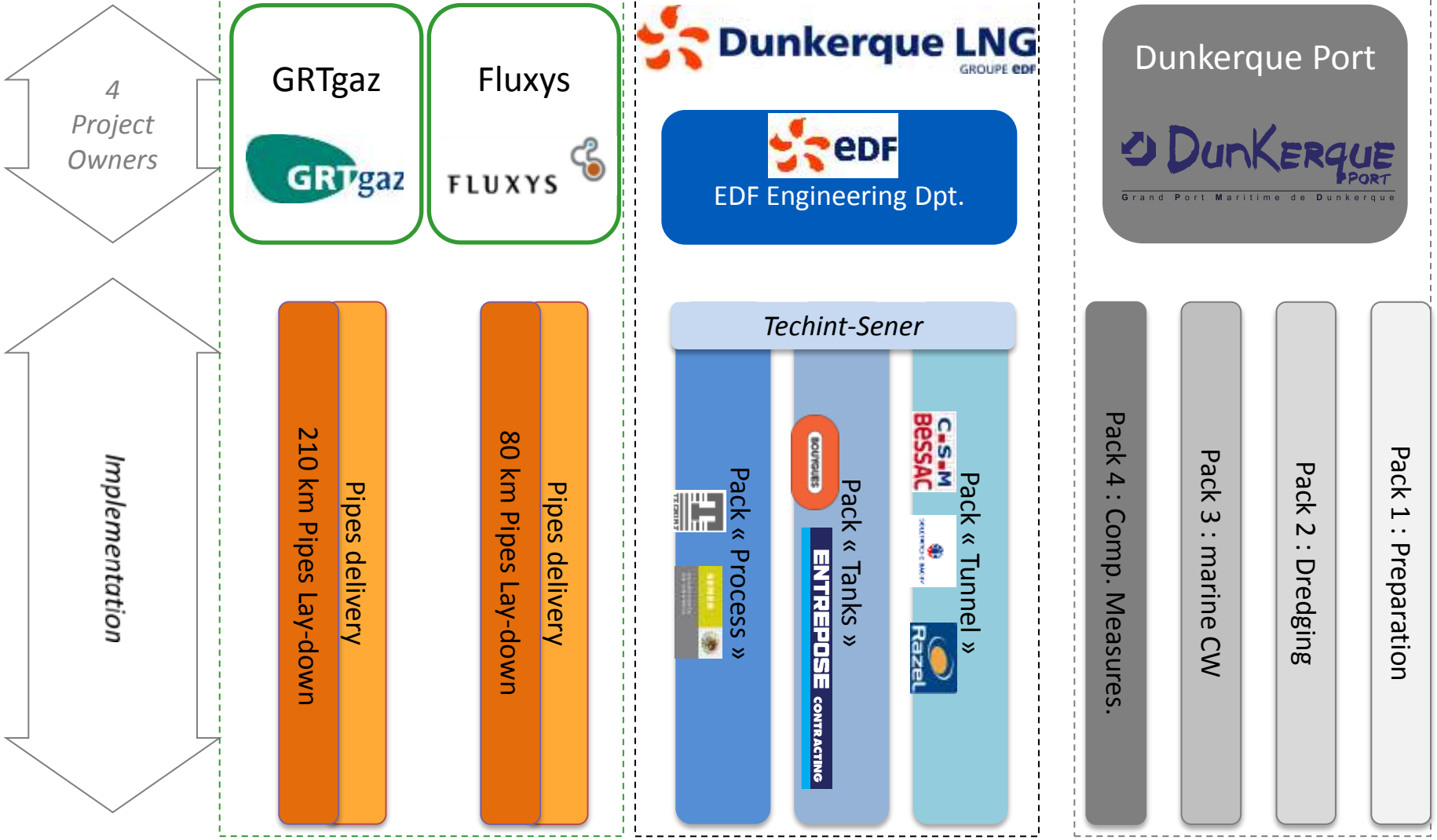


- The final boundaries of the site are technically more complex

80% of biodiversity preservation

How?

Strong and innovative industrial scheme



How?

Commercial attractiveness

Focus on the port location

- **Dunkerque port: 3rd largest port in France**
  - With **room enough for traffic**
  - Main necessary **port services** available (pilot station, tugs, mooring…)
- Easy, **quick and safe access** from the sea Channel
- Up to **Qmax vessels** allowed
- Very **limited meteorological constraints** on vessel movements

How?

Commercial service attractiveness

New LNG gate for supplying gas to NW Europe

- Direct connection to **French** Transmission System
- Direct connection to **Belgian** Transmission System
- Further access to Germany, Netherlands, United Kingdom

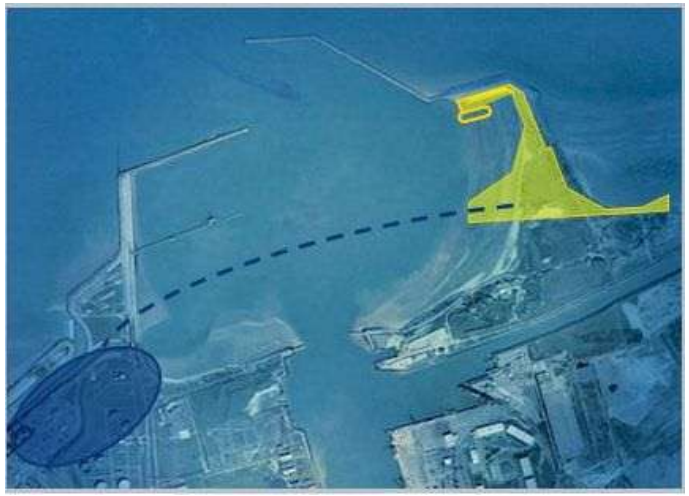
Dunkerque LNG terminal will be effectively connected to 2 North West European gas grids as soon as the start-up of the terminal

How?

Commercial service attractiveness

Zero gas-use thanks to an environment-friendly warmth supply

- **The heat to vaporize LNG will be supplied by warm water from the nuclear power plant.**



- 5 km-long
- 3m diameter

- **Gravelines nuclear power plant is a safe source of supply**
  - 6 reactors, with a total power of 5,460 MW
  - Warm water supplied by 4 units (about 5% of total send-out of warm water)
  - Triple redundancy

- **Positive environmental and financial impacts**
  - Reduction of the environmental impact of both the power plant and the terminal
  - No service gas: saving C02 up to 100 000T/y

How?

Commercial service attractiveness

Upstream and downstream flexibility

Dunkerque LNG
GROUPE EDF

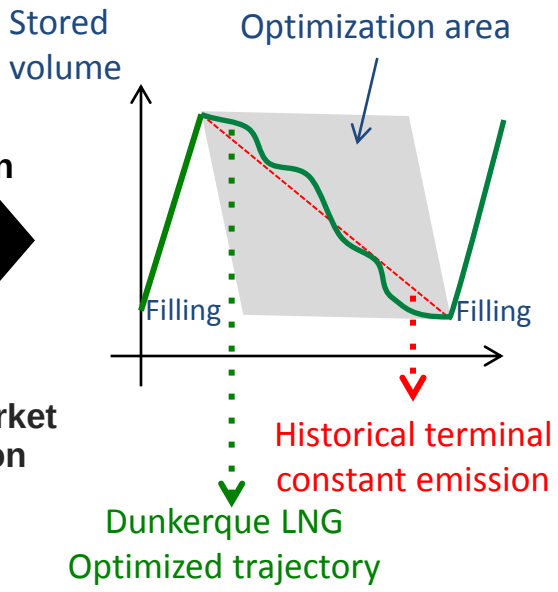
Delivery

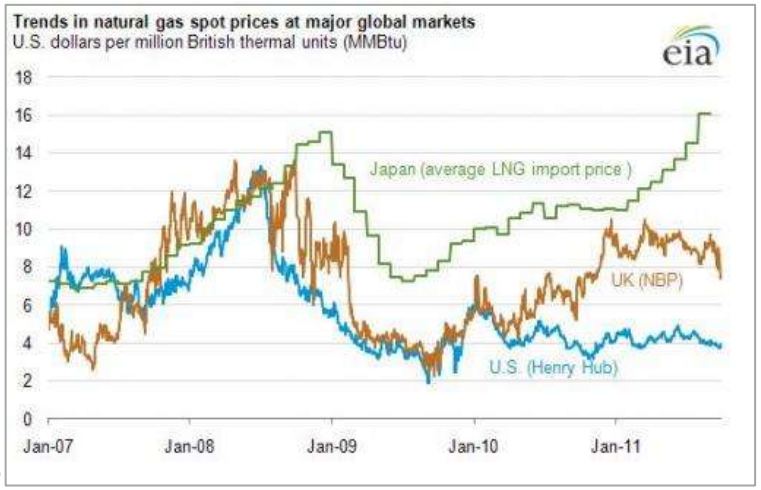
570,000 m3

Modulation

Global market Optimization

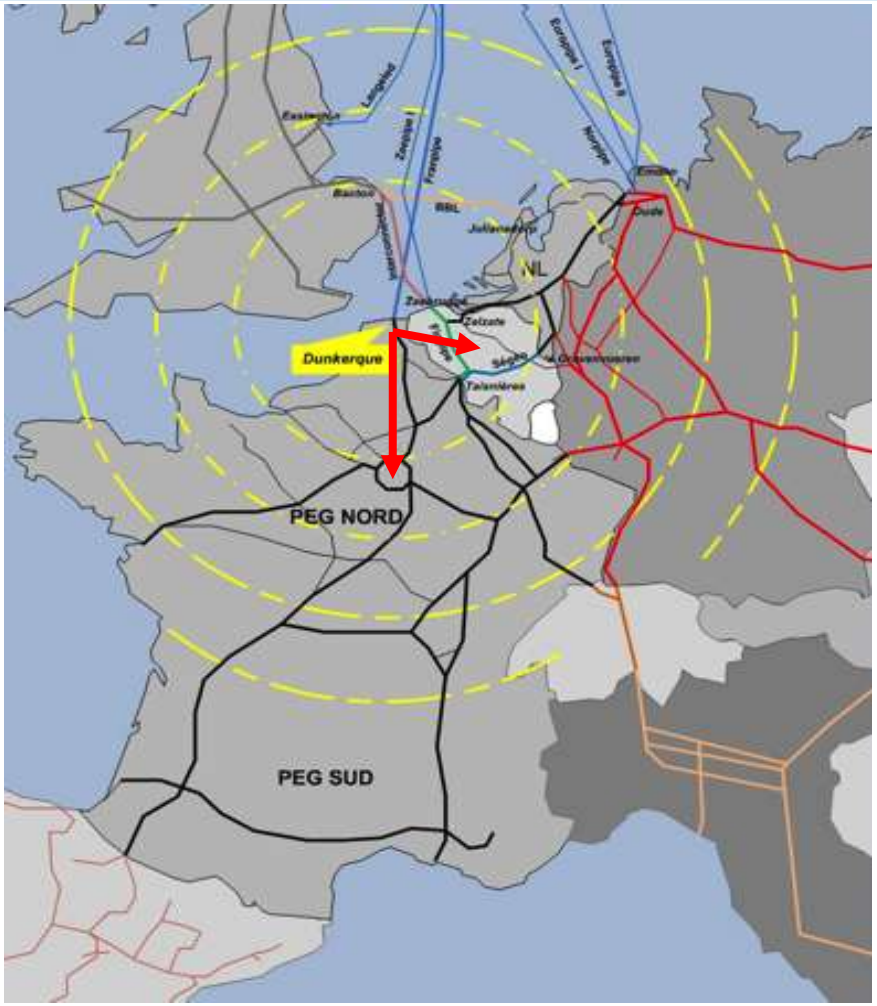
Regional market Optimization






RESULTS

The 13 Bcma re-gasification terminal approved on 27 June 2011 for a start-up expected in November 2015



EDF — FLUXYS — TOTAL

65% | 25% | 10 %

SHAREHOLDERS AGREEMENT

Dunkerque LNG GROUPE EDF

CAPACITY BOOKING AGREEMENT

8 Bcma | 2 Bcma | 3 Bcma

EDF — TOTAL — Available

A strong partnership of industrial groups having huge experience
Dunkerque LNG terminal offers the best gateway to supply gas to NW Europe

Construction works started for about 10 months – August 2011

Construction works started for about 10 months – May 2012

Thank you for your attention!

Dunkerque LNG
GROUPE EDF

c.liaud@dunkerquelng.com
+33 6 08 24 72 34