Case study Summary sheet

Context

CASE STUDY

Footprint use category: Project / Site
Assessment time: Construction: 2014 - 2016, Offset: 2017 - 2059
Business application: Biodiversity management & performance

Perimeter

		LU Pressure	CC Pressure	Aquatic and other Pressures
Scope 1		✓ (Evaluated company)	✓ (Evaluated company)	☐
Scope 2		☐	☐	☐
Scope 3	Tier 1	☐	✓ (Evaluated company)	☐
	Rest of value chain	✓ (Evaluated company)	✓ (Evaluated company)	☐
	Downstream	✓ (Asset owner)	✓ (Asset owner)	☐

✓ Asset owner ✓ Evaluated company

COMPANY'S IDENTITY

GRTgaz

Industry
Energy

Sub-industry
Gas distribution

2017 turnover
EUR 1.9 billion

Why?

ASSESS BIODIVERSITY FOOTPRINT OF INFRASTRUCTURE PROJECTS WITH A METHODOLOGY THAT COULD BE SHARED IN THE SECTOR, AND REPRODUCED FOR FINANCIAL INSTITUTIONS FOR THEIR ESG ANALYSES

When?

2 DIFFERENT TIME PERIODS: 2014 - 2016 FOR THE IMPACTS WHICH ALREADY OCCURED DURING THE PIPELINE CONSTRUCTION, AND 2017 - 2059 FOR A PREDICTION OF EXPECTED GAINS GENERATED BY THE OFFSET MEASURES. PIPELINE OPERATION, MAINTENANCE AND END-OF-LIFE ARE EXCLUDED FROM THE ANALYSIS

How often?

ONE OFF WITH AN *EX POST* EVALUATION OF THE CONSTRUCTION PERIOD, AND AN *EX ANTE* EVALUATION OF THE OFFSET PROJECT

What?

BIODIVERSITY FOOTPRINT OF THE CONSTRUCTION OF THE PIPELINE (DIRECT OPERATION AND UPSTRAM IMPACTS), AND OF THE BIODIVERSITY OFFSET MEASURES

For who?

INTERNAL USE, STRATEGY, PROJECTS' ESG ANALYSIS FOR BOTH THE COMPANY AND INVESTORS

How detailed?

EXTRACTION OF GIS DATA ON LAND USES AT THE PROJECT LEVEL (PIPELINE EASEMENT BAND AREA) AND FOR EACH OFFSET SITE

DATA COLLECTED

Item	Description	Source
Land use changes	Land use transformation (ha) due to the construction	GRTgaz
GHG emissions	GHG emissions linked to the construction, detailed per Scope	EIA study of the project
Pipeline materials	Material composition of the pipelines (in terms of weights)	EIA study of the project
Biodiversity offset land use changes	Land use transformation (ha) due to the biodiversity offset programme	CDC Biodiversité
Ownership breakdown	Share of GRTgaz detained by each shareholder and debt owner	CDC DIDL

Footprint analysis

RESULTS

Scope 1 **Static** footprint **5** MSA.km²

Total **Dynamic** footprint Construction **2.18** MSA.km²

Expected offset gain
0 to **- 0.35** MSA.km²
(<0 : gain, >0: loss)

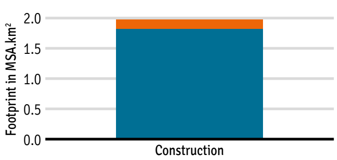
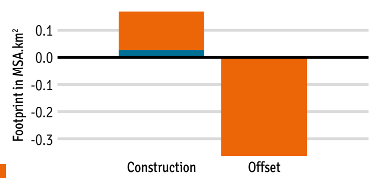


Figure 30: Dynamic biodiversity footprint of the Arc de Dierrey project per scope related to climate change



Scope 1
Scope 3

Figure 31: Dynamic biodiversity footprint of the Arc de Dierrey project per scope for spatial pressures

(source: GBS calculations, April 2019)

KEY MESSAGES

Disclaimer: The GBS is not fully designed for project scale assessments, the results of this case study are provided as indicative impacts

➔ During the construction, the most significant dynamic footprint is caused by the climate change pressure generated by the manufacturing of the pipelines

➔ The total land use change Scope 1 impact is mainly related to forest clearance on the easement strip

➔ Static impacts should be seen as a reservoir of biodiversity that can be regained, even though the whole static impact is not attributable to GRTgaz (agricultural crops)

➔ This case study showcases the application of the GBS to assess and forecast positive impacts of biodiversity offset measures in terms of functional biodiversity, besides the expected gains of those measures for species populations and their habitat.

IMPROVEMENTS

➔ Developments on other pressures refined assessment are needed to have a better coverage of the overall biodiversity impacts

➔ The project value chain is not fully taken into account, especially for some pipelines construction material (concrete, polyethylene)

➔ The trend of biodiversity gains over time should be refined in the future

4.2 GRTgaz

4.2.1 Context and objectives

The Caisse des Depôts et Consignations (CDC), a French public financial institution, has been exploring the best options to integrate biodiversity into ESG criteria for the assessment of projects for years and expressed interest in piloting the GBS to explore how it could meet this need. Discussions with its Investments and local development management direction (CDC DIDL), which supports the development of territories and invests in infrastructure projects, led to the identification of GRTgaz as a potential partner to lead an exploratory case study. GRTgaz is a French company specialized in the construction, operation and maintenance of natural gas pipeline networks. A public consortium including the CDC is among the shareholders of GRTgaz. Assessing a GRTgaz project would thus amount to evaluating a project indirectly financed by CDC. Discussions with GRTgaz led to the choice of the **Arc de Dierrey** project to explore a **"Project/site" and "Biodiversity management & performance"** application of the GBS. This is not (and will not become) a typical use of the GBS, so the results of this case study should not be considered as formal results of the tool, but rather as exploratory data to illustrate how the tool deal with site level data before aggregating them.

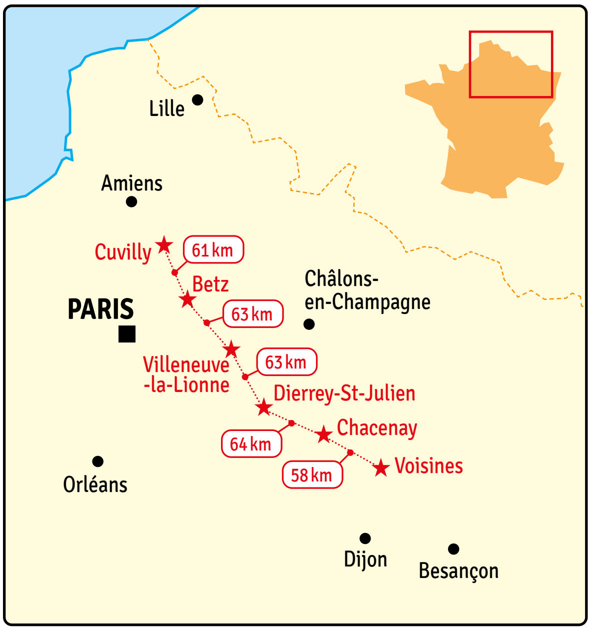


Figure 32: ***"Arc de Dierrey" pipeline layout*** *(source : GRTgaz*)*
**http://www.grtgaz.com/fr/medias/communiques-de-presse/gazoduc-arc-de-dierrey.html*

The Arc de Dierrey project consists in the construction of a **natural gas pipeline** of about 310 km that would complete the French natural gas network and enable the distribution of natural gas imported in the liquified natural gas (LNG) terminal in Dunkerque to Eastern and Southern France (Figure 32)[56]. The project budget is about EUR 623 million and the construction lasted from 2014 to 2016. After the pipe-laying, the impacted pastures and crops are rehabilitated, but impacted forestry areas cannot always be restored as an easement strip over the pipeline is set up for technical and regulatory reasons. No tree nor construction can be installed over the easement strip, which is for the most part 20 m wide. The mitigation hierarchy was followed in the design of the project: impacts on biodiversity were first avoided, then remaining impacts were reduced, and finally biodiversity offset measures were identified to compensate the residual impacts.

This case study aims to determine the **biodiversity footprint due to the construction of this pipeline between 2014 and 2016, and to assess the likely effects of the biodiversity offset measures after 2017**. It excludes the operation, maintenance and end-of-life phases of the pipeline life cycle. **Direct operation impacts** (Scope 1 from the perspective of GRTgaz) are taken in account, and **upstream impacts** (Scope 3 for GRTgaz) like those generated by the production of the pipeline materials are assessed. For CDC DIDL, as a financer of the project, all the assessed impacts fall within its downstream Scope 3. Only the terrestrial land use change and climate change pressures are assessed in this case study.

(56) http://www.grtgaz.com/fileadmin/grands_projets/arc_dierrey/documents/fr/presentation-projet-arc-de-dierrey-sept2014.pdf

4.2.2 Methodology

GRTgaz provided data on **aggregated surfaces per land use type of areas impacted** by the pipeline construction. The data was limited to land occupation and did not include information about land conversion (*i.e.* what was the previous land use). The environmental impact assessment (EIA) study was used to gather data on **greenhouse gas emissions** in all Scopes during the construction phase. The EIA also provided data on the **materials composing the pipelines**.

To "dimension", or assess, the impacts, the **pressure-impact relationships** of GLOBIO were used on data about **land use change and climate change**, in a typical pressure-based refined assessment. The precise methodologies are explained in the latest technical developments of the GBS of our last publication (CDC Biodiversité 2019b). The Scope 3 impacts associated to the extraction of iron upstream of the production of the steel used in the pipeline was estimated with the **mining CommoTool**. On top of this, **data on the areas and types of offset measures** were provided by the technical assistance to GRTgaz (entrusted to the operational team of CDC Biodiversité). The offset measures were further translated into land use changes (*e.g.* from "Pasture – man-made" to "Forest – reduced impact logging).

Following this dimensioning, the impacts can be attributed among capital owners - the methodology applied to listed equity and corporate date in our last report (CDC Biodiversité 2019b) was applied to GRTgaz by using the equity share of its owners. Data was thus collected to conduct this attribution. The **breakdown of the ownership of GRTgaz by shareholders** and the **debt structure** was provided by CDC DIDL. Balance sheets of the different companies were retrieved from public financial reports and prospectus for admission to trading.

4.2.3 Results and discussion

A IMPACTS DIMENSIONING

Figure 30 and 31 displays the **summary graphs of the dynamic biodiversity footprints assessed during the construction phase and the offset phase**, split between the climate change pressure and other terrestrial pressures and by Scopes. The breakdown of biodiversity footprints per Scope and pressure and the associated impacts intensities – impacts divided by the project budget – are displayed on Table 9. For the construction phase, the most significant dynamic footprint is caused by the climate change pressure generated by **the manufacturing of the pipelines**, representing a **loss of 1.8 MSA.km²** (260 soccer fields). The remaining footprint linked to spatial pressures has a relatively low impact intensity (maximum 0.53 MSA.m²/kEUR) compared to the world average biodiversity impact intensity of 2 MSA.m²/kEUR. The **total land use change Scope 1 impact is a loss of 0.14 MSA.km²**, mainly related to the forest clearance on the easement strip. The cleared forest cannot be replaced on the easement strip as trees higher than 2.7m are not allowed there.

Conversely, the **biodiversity offset measures implemented between 2017 and 2059** are expected to yield **dynamic gains of up to 0.35 MSA.km²** if the measures are successfully carried out over the period.

Static impacts are assessed for the **Scope 1 land use change impact** and are mainly caused by the land use **"Intensive agriculture"**. They amount to an **impact of 5 MSA.km² (714 soccer fields)**. In this case study, the area under the easement strip was considered to belong to GRTgaz' Scope 1 and the Intensive agriculture land uses thus fall into its Scope 1. However, these land uses predate the Arc de Dierrey project and GRTgaz did not generate the associated static impacts in the first place. The static impact can be seen as a **potential reservoir of biodiversity that can be regained** if renaturation actions were implemented.

Scopes and pressures	Dynamic	
	MSA.km² losses	Intensities MSA.m²/kEUR
SCOPE 1 – SUB-TOTAL	**0 to 0.34**	**0 to 0.53**
Land use – easement strip	0.14	0.23
Land use - biodiversity offset measures	-0.35 to 0 (gain)	-0.58 to 0
Climate change	0.2	0.3
SCOPE 3 UPSTREAM (PARTIAL) – SUB-TOTAL	**1.84**	**2.96**
Climate change for the pipelines manufacturing and transportation	1.8	2.9
Iron extraction (world average mix)	0.04	0.06
SCOPE 1 + 3 UPSTREAM	1.8 to 2.2	2.9 to 3.5
vs World biodiversity impact intensity (Scope 1)		2

Table 9: *Summary of the dynamic biodiversity impacts of the project*

Easement strip of the gas pipeline © ARTELIA, 2019

B IMPACTS ATTRIBUTION

The "Arc-de-Dierrey" project is part of GRTgaz' investment programme between 2011 and 2020 and is thus 100% financed by GRTgaz. Attribution factors are computed to determine the biodiversity footprint of the project which could be attributed to CDC, as a capital owner (equity and debt) of GRTgaz. Figure 33 presents the structure of ownership and debts of GRTgaz:

CDC finances GRTgaz through three channels, all going through SIG, a holding company which owns 24.91% of GRTgaz' equity. CDC owns 46% of the EUR 586 million debt of SIG[57]. Two of its entities also own indirect equity stake in GRTgaz. CDC General section (GS) and CDC Savings fund (SF) are shareholders in HIG, which itself owns SIG. An attribution factor (AF) can be calculated and is equal to the ratio between the financed value (financed equity or debt) and the enterprise value (total equity and debt). In this example, the biodiversity footprint attributed to CDC for the Arc-de-Dierrey project is expressed as follows (Table 10):

$$Footprint_{CDC} = Footprint_{GRT} \times (AF_{CDC} + AF_{GS} + AF_{SF})$$

The total Scope 1 and Scope 3 dynamic impact of the "Arc de Dierrey" project attributed to CDC is thus about **0.1 MSA.km²** which is equivalent to a dozen soccer fields, and the static Scope 1 impact of the "Arc de Dierrey" project attributed to CDC is about **0.2 MSA.km².**

C LIMITS AND IMPROVEMENTS

The materiality of several pressures was considered to be limited compared to the efforts required to assess them in terms of data and calculations. These pressures are human encroachment, habitat fragmentation, atmospheric nitrogen deposition and aquatic pressures. As the GBS is still under development and some Commodity and Services Tools are not yet completed, some impact factors are lacking. The project's value chain is thus not fully taken into account, especially regarding the concrete and polyethylene used in the construction of the pipeline.

In this case study, we also assumed that some biodiversity gains happen in a short time scale to simplify the computations. However, reforestation may actually require several decades to be completed so biodiversity gains may be delayed.

Overall, the GBS is not designed and fit for project scale assessments: the use of its pressure-impact relationships causes its results to adequately reflect the average impact of a large entity but not the individual impacts of small projects or sites. Here we can roughly estimate that the project area is about 600 ha maximum (300 km x 20m easement strip max, in some departments the easement strip is only 10m or 15m wide). As a rule of thumb, we consider that the GBS should be used only for areas above a threshold of 100-1000 ha (*cf.* 4.2). The results of this case study are thus provided as indicative impacts but might not be usable for external disclosure and reporting.

4.2.4 Lessons learnt

For the GBS team, this case study led to improvements in the data collection process and to the development of specific calculations for "refined assessments" of the land use pressure. We also started to work on better describing GLOBIO land use categories in order to match them to land use categories identified by companies. This case study is also an example of the application of the GBS to assess and forecast positive impacts of biodiversity offset measures in terms of ecological integrity, besides the expected gains of those measures for species populations and their habitat.

For GRTgaz, the pilot highlighted the materiality of impacts occurring upstream in the value chain, *i.e.* those related to the manufacture of the pipes. In order to reduce the impacts of the pipeline construction on biodiversity, mitigating the upstream climate change impacts (Scope 3 for GRTgaz) could be an important lever, and could be achieved through carbon offset programmes. Such programmes could also provide co-benefits for other pressures such as land use change. The quality of the biodiversity offset programme and its outcomes can also be a key point in reducing the biodiversity impacts of the pipeline construction. This analysis strengthens the interest to consider the Scope 3 in EIA in accordance with regulation, as in practice the current EIA framework mainly focuses on Scope 1 direct operation impacts while Scope 3 impacts could potentially be more important than Scope 1 impacts. However, properly avoiding and reducing Scope 1 impacts remain critical, in particular for impacts on endangered or protected species or their habitats. And residual impacts should continue to be offset, in accordance with the mitigation hierarchy. The GBS thus comes as a complement to the existing framework, to cover upstream and downstream impacts and capture the Scope 1 impacts on species abundance.

CDC DIDL got a better understanding of the GBS approach with this case study. Other infrastructure projects should be tested out (railways, highways) to verify if the GBS methodology can be reproduced to assess other infrastructures projects.

(57) Here to simplify, the bond of EUR 586 million indicated on Figure 33 is considered to represent the total debt of SIG although there could be a slight difference with the figures in the balance sheets of SIG.

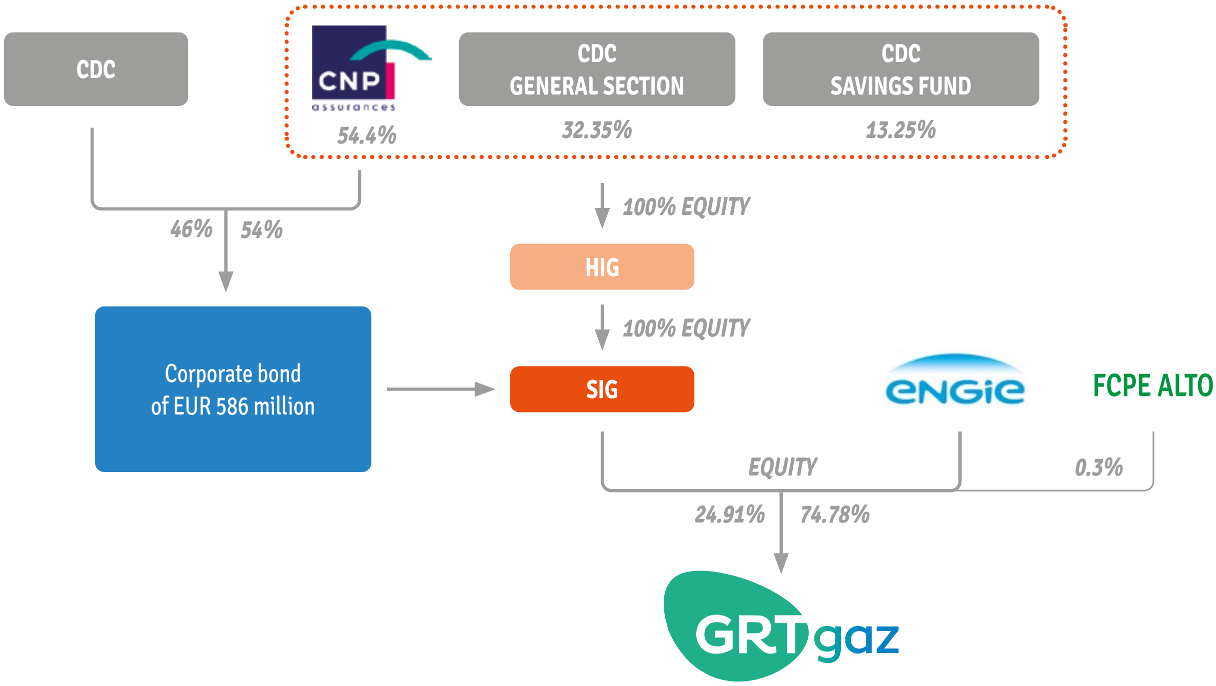


Figure 33: ***Structure of ownership and debts of GRTgaz in July 2018*** *(source: CDC)*

FINANCING SOURCE	**Attribution factor (AF) of GRTgaz' footprint to the financing source***
CDC	$\frac{3\,848\,000\,000 \times 24.91\,\%}{10\,643\,000\,000} \times \frac{586\,000\,000 \times 46\,\%}{1\,216\,620\,000} = \mathbf{2\,\%}$
CDC General section	$\frac{3\,848\,000\,000 \times 24.91\,\%}{10\,643\,000\,000} \times \frac{704\,135\,000 \times 100\,\%}{1\,216\,620\,000} \times \frac{658\,588\,388 \times 32.35\,\%}{658\,606\,917} = \mathbf{1.7\,\%}$
CDC Savings fund	$\frac{3\,848\,000\,000 \times 24.91\,\%}{10\,643\,000\,000} \times \frac{704\,135\,000 \times 100\,\%}{1\,216\,620\,000} \times \frac{658\,588\,388 \times 13.25\,\%}{658\,606\,917} = \mathbf{0.7\,\%}$
Attribution factor of GRTgaz' footprint to CDC group	2% + 1.7% + 0.7% = 4.4%

* Data sources for attribution factors computation:
Total equity of GRTgaz (EUR 3 848 million) and enterprise value of GRTgaz (EUR 10 643 million): http://www.grtgaz.com//fileadmin/plaquettes/fr/2018/RADD2017.pdf ;
Total debt of SIG (EUR 586 million): from CDC (c.f. Figure 33) ;
Total market capitalization of SIG (EUR 704 135 000) and enterprise value of SIG (EUR 1 216 620 000): http://societe-infrastructures-gazieres.com/Rapport_du_Commissaire_aux_comptes_sur_les_comptes_consolides_au_31_d%C3%A9cembre_2016_incluant_les_comptes_consolides_de_l_exercice_clos_le_31_decembre_2016.pdf ;
Total market capitalization of HIG (EUR 658 588 388) and enterprise value of HIG (EUR 658 606 917): https://www.verif.com/bilans-gratuits/HOLDING-D-INFRASTRUCTURES-GAZIERES-532779105/

Table 10: ***Attribution factors of GRTgaz' biodiversity footprint***