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From Imposition to Contribution: The Gas Flaring Tax in Algeria as a Catalyst for Sustainable Development - A Case Study of the Hassi Bir Rekaiz Joint Venture

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Abstract

This research aims to investigate the transformation of a gas flaring tax in Algeria from a mere imposition to a catalyst for sustainable development. The methodology combines a qualitative approach through literature and regulatory analysis with a quantitative approach simulating tax calculations. The study reveals that the tax, determined annually by ALNAFT, is tied to flaring operations conducted under a license. The tax contributes to the goal of achieving zero routine flaring by 2030 and funds the National Fund for Renewable Energy. In practice, HBR Joint venture obtained eight permits for gas flaring in 2022, with an estimated tax value of 13,437 DZD and 2,016,970.96 DZD.

Keyword: flaring tax, flared gas, Environmental taxation, Sustainable Development, Tax Calculation, Algeria

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1. INTRODUCTION

Flaring involves the burning of the untreated "wet" byproduct of natural gas that emerges during oil well production. Typically, this occurs when the operator of the well faces challenges in transporting the wet gas to a facility for processing, where methane can be separated from other liquids in natural gas. (Blundell & Kokoza, 2022)

Flaring results in the squandering of a valuable energy resource, leading to significant negative environmental consequences and economic losses, as outlined in the GE Energy report (Mohammad Soltanieh, 2016)

The rise in greenhouse gas (GHG) emissions, attributed to human activities like the combustion of fossil fuels and deforestation, has been associated with climate change. (Alemu, 2014)

According to the World Bank the latest Global Gas Flaring Tracker Report, finds that global gas flaring decreased by three percent to 139 bcm in 2022 from 144 bcm in 2021due to Regulatory Measures and fiscal policies to discourage the wasteful practice of flaring and promote the efficient utilization of natural gas resources. (bank t. w., Global Gas Flaring Tracker Report, 2023)

As per the U.S. Energy Information Administration, Algeria stands out as a prominent producer of crude oil and natural gas in Africa. (Administration, 2023) Has been grappling with the challenge of gas flaring for years. The introduction of the flaring tax signifies the government's commitment to mitigating the environmental impact of the oil and gas sector while maximizing the economic benefits derived from these resources.

Sustainable development encapsulates the concept of intergenerational fairness by guaranteeing that the present generation can fulfill its requirements without jeopardizing the ability of future generations to fulfill theirs. (Laranja Ribeiro, 2021);

To achieve this goal, several initiatives have been launched, such as ZRF 2023 and the Renewable Energy Development Program…

Environmental taxes have taken various forms, but they share a common goal. One notable example is the gas flaring tax.

In this context, it is crucial to ask the problematic of how can the implementation and evolution of the Gas Flaring Tax in Algeria effectively transform gas flaring from a regulatory imposition into a strategic contribution to sustainable development?

The main question includes the following sub-questions

What are the specific components and elements of the Flaring Gas Tax in Algeria?

What criteria and data are used in the calculation process of the Flaring Gas Tax?

How can the reduction of gas flaring serve sustainable development?

How is the gas flaring tax calculation process applied in the case of the Hassi Bir Rekaiz Joint venture?

The study employs a mixed-methods approach, combining qualitative analysis of relevant literature and regulatory documents with quantitative modeling to simulate the calculation process of the Flaring Gas Tax in Algeria, particularly within the context of the Hassi Bir Rekaiz project.

2. The Fiscal Incentive of the Flaring Gas Tax in Algeria :

This section delves into the necessity of implementing the flaring gas tax in Algeria, highlighting Conceptual framework of this tax,.

2.1 the necessity of implementing the flaring gas tax in Algeria:

2.1.1 definition of the flaring gas tax:

- flaring gas:

Flaring is the operation of burning natural gas directly into the atmosphere (Republic T. A., 2005)

Flaring is a technique that the oil and gas industry uses for getting rid of unwanted flammable gases by burning them (McEwen, 2012),

- Flaring tax :

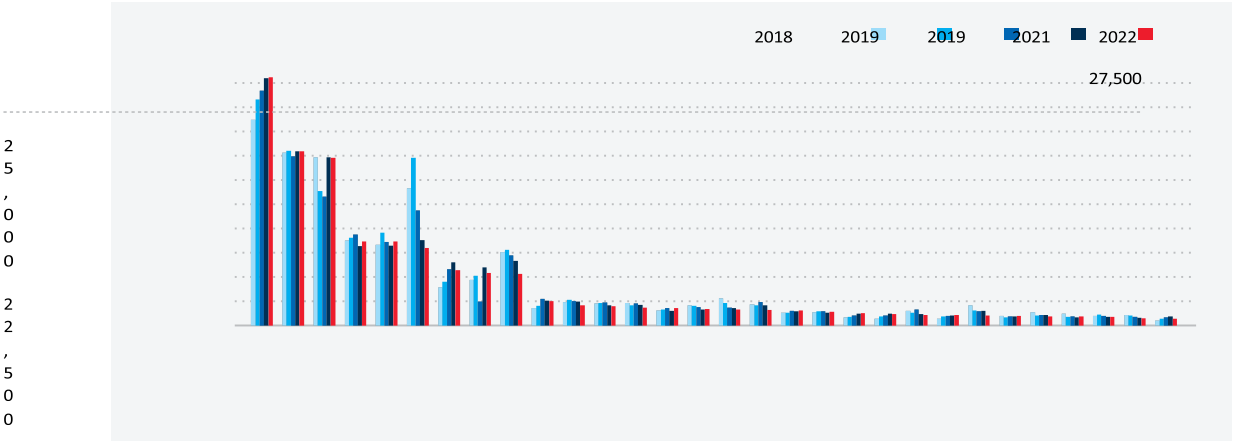
The flaring tax falls under the category of environmental taxes, more specifically, occasional taxes.

Flaring tax is a tax Established by Law No. 05-07 related to hydrocarbons, it is a provision that mandates every contractor holding a flaring permit issued by ALNAFT to pay a specific tax to the Public Treasury (BELFATMI, 2019)

2.1.2 Evolution of flaring gas volume :

This figure below illustrates the changing volume of flaring gas over time, providing Insights into the progression and trends of this practice in a concise visual representation.

Figure 01: Flare volumes for the top 30 flaring countries from 2018 to 2022



Source: NOAA, Payne Institute and Colorado School of Mines, GGFR

-interpretation:

In 2022, the majority of flaring activity was concentrated in a limited number of countries, as the top nine nations accounted for 74% of flare volumes and represented 45% of the world's oil production. These countries, listed in sequence, include Russia, Iraq, Iran, Algeria, Venezuela, the United States, Mexico, Libya, and Nigeria. (Group, 2023)

2.2 Conceptual framework of flaring gas tax :

The conceptual framework of the flaring gas tax section outlines the tax's objective, the applied rate/tariff, and the tax base, Taxpayers, Exemptions and finally the authority responsible for this tax.

2.2.1 The objective of flaring gas tax:

Environmental taxes serve as a versatile tool to minimize the overall expenses associated with achieving pollution reduction goals, promote technological innovation, and facilitate further reductions in pollutant emissions. (Abiddine, 2013)

The goal of the flaring gas tax in Algeria is to decrease the quantity of natural gas flared, or combusted, at oil and gas production sites) bank t. ‹GLOBAL FLARING AND VENTING REGULATIONS(2021 ‹

2.2.2 The applied rate/tariff :

The flaring gas tax in Algeria is set at DZD 12,000 per thousand cubic meters (m^3), approximately equivalent to US$90 per 1,000 m^3. This tax cannot be deducted when calculating other payments within the upstream fiscal regime. (Agency, 2019)

The annual flaring tax rate is determined by ALNAFT and is published in the Official Journal, in accordance with the most recent hydrocarbons law. In this case, it pertains to Law 19-13, which was published in 2019.

The specified tariff undergoes annual indexation at the start of each calendar year by ALNAFT. This adjustment is based on the Consumer Price Index released by the public entity responsible for publishing the index in Algeria. (Republic A. , Article 210 of Law 19-13, 2019)

2.2.3 The taxe base :

The tax amount is computed by considering the quantities flared in a specific calendar year and the indexed rate communicated by ALNAFT for upstream activities and by ARH for downstream activities for that particular year.. (Republic A. , article 211 of Law 19-13, 2019)

The taxe base for the flaring gas tax in Algeria is the quantity of flared natural gas, measured in thousand cubic meters (m^3). The tax rate is then employed to this volume to ascertain the corresponding tax amount.

2.2.4 Taxpayers:

Individuals subject to flaring tax include those associated with the national company operating within the framework of upstream concessions, as well as parties involved in hydrocarbon contracts. These stakeholders are liable for this tax due to their involvement in flaring operations, a process involving the combustion of unused gases during hydrocarbon production. (Republic A. , article 212 of Law 19-13, 2019)

2.2.5 Exemptions:

The following cases are exempt from the payment of the flaring gas tax:

- During the execution of exploration activities, during exploration and/or delineation well testing operations, as well as during pilot implementation.
- During the startup period of new installations for periods, not exceeding the thresholds set by ALNAFT and ARH.
- For areas where the infrastructure for gas recovery and/or evacuation is nonexistent or limited.
- installations undergoing compliance works (Installations and equipment established before July 19, 2005, remain subject to the conformity requirements as defined by regulatory means.) (Republic A. , Article 215-235 of Law 19-13, 2019)

2.2.6 The authority responsible for this tax :

In Algeria, two authorities administer the flaring gas tax:

- The National Agency for the Valorization of Hydrocarbon Resources (ALNAFT) is responsible for collecting data on flaring and transmitting it to the ARH. (Republic A. , Article 36-42 of Law 19-13)

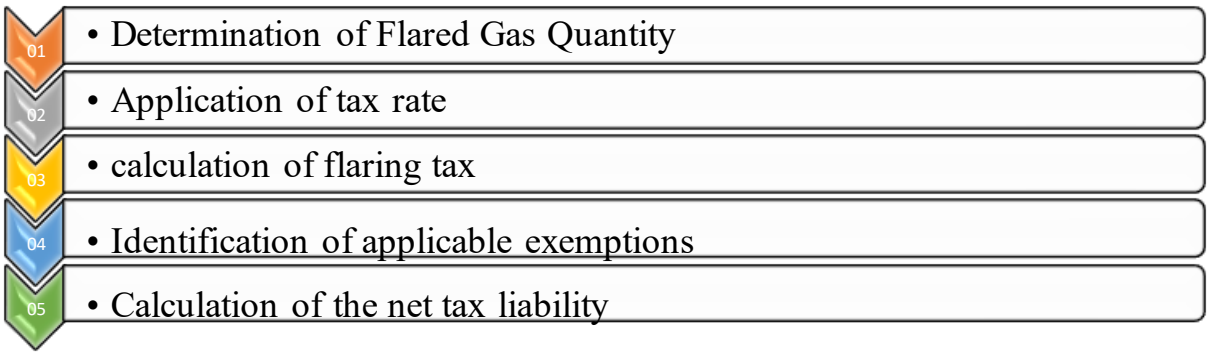
- The Hydrocarbons Regulatory Authority (ARH) is responsible for collecting and administering the tax. The ARH is also responsible for monitoring the quantities of gas flared and vented, the duration of flaring, and the venting of gas in downstream activities. (Republic A. , article 44 of Law 19-13, 2019)

3. Calculation and Declaration of the Flaring Tax in Algeria

This section is a comprehensive overview of the process involved in determining and reporting the tax liability for flared gas tax in Algeria:

The flaring tax calculation process is illustrated in the following diagram:

Figure 02: the flaring tax calculation process



Source: Prepared by the author based on internal documents from HBR Joint venture

3.1 Determination of Flared Gas Quantity:

According to Article 160 of Law 19-03, both ALNAFT and ARH oversee flaring operations as well as the quantities of gas flared. ALNAFT is responsible for monitoring upstream activities, while ARH oversees downstream activities. This oversight is executed through the issuance of permits that define the volume of flared gas. The determination of flared gas volume involves a two-step process: the granting of authorization by ALNAFT, followed by subsequent monitoring carried out by the same organization. (Republic A. , Article 160 of Law 19-13, 2019)

3.1.1 ALNAFT's Authorization for flaring gas:

A flaring permit is a regulatory act that grants permission for flaring based on estimated flared quantities.

A flaring permit may be granted exceptionally by ALNAFT upon request from the national company under the upstream concession or from the contracting parties under a hydrocarbons contract, or by ARH upon request from the downstream operator or concessionaire (Republic A. , article 158 of Law 19-13, 2019)

In the event that flaring operations are conducted without authorization or exceed the threshold of the authorized quantity, the flaring fee shall be paid with a surcharge of 50%, in accordance with the provisions of Article 213 of Law 19-03 on hydrocarbons

3.2 application of tax rate :

The flaring fee rates are announced annually by ALNAFT in accordance with the articles of the hydrocarbons law

Flaring operations are subject to the payment of a specific and non-deductible fee of twelve thousand Algerian dinars (12,000 DZD) per thousand standard cubic meters (NM3) of flared gas(the year of 2022).

The above tariff is subject to annual indexing by ALNAFT at the beginning of each calendar year, based on the consumer price index published by the public entity responsible for releasing the said index in Algeria.

For this indexing, the base index is the annual consumer price index in effect on the date of the publication of this law in the Official Journal of the Democratic and Popular Algerian Republic (Republic A. , Article 210 of Law 19-13, 2019)

3.3 calculation of flaring gas tax :

according to the article 213 of the hydrocarbon law 19-03 The amount of the fee is calculated based on the flared quantities during a given calendar year and the indexed rate notified by ALNAFT for upstream activities and by ARH for downstream activities, for the respective year (Republic A. , article 213 of Law 19-13, 2019)

Based on the definition above, we can derive the following formula:

Figure 03: The formula for calculating the flaring tax amount

The amount of the flaring fee = Flared gas volume (Nm3) * Indexed and updated base tariff

Source: Prepared by the author based on legislative texts

3.4 identification of applicable exemptions:

The exemptions listed under the heading "Exemptions" must be deducted from the amount of the flaring tax.

3.5 Calculation of the tax net liability :

The following formula can be used to calculate the flaring tax net liability:

Figure 04: the formula of the calculation of the flaring tax net liability

Flaring tax net liability = the amount of the flaring fee - Exemptions

Source: Prepared by the author based on legislative texts

This formula is a simplified way to calculate the amount of flaring tax that a company owes. The flaring fee is the total amount of tax that would be owed if there were no

exemptions. The exemptions are any reductions in the tax liability that the company is eligible for.

3.6 declaration and payment of the Tax

In this part, we will examine the declaration documentation for this fee, as well as the payment procedures, deadlines, and related details

3.6.1 declaration documentation:

- A signed covering letter referencing the authorization is required, containing the start and end dates of the flaring operation, the amount remitted, and the reference number of the bank transfer or check
- A declaration table encompassing all elements pertinent to the calculation and payment of the fee.
- A copy of the bank transfer order issued in favor of the receiver at the DGE (Directorate of Large Enterprises).
- The template used for calculating the fee on flared volumes for each perimeter and flaring operation. This template compiles the necessary information to be provided by each of the entities.

(Abiddine, 2013)

3.6.2 The entity responsible for tax collection and deadlines :

The flaring tax is declared and paid to the tax administration by

- the national company under the upstream concession;
- the contracting parties under the hydrocarbons contract;

- the downstream operator for downstream activities or by the concessionaire for pipeline transportation activity;

No later than January 31 of the year following the year in which the quantities of gas were flared.

(Republic A. , article 212 of Law 19-13, 2019)

4. . The contributions of the Gas Flaring Tax in Algeria to sustainable development :

In this section, we will delve into the benefits of the Gas Flaring Tax in the context of sustainable development, exploring its evolution from a tax mechanism to its contributions to international sustainable development projects.

4.1 Global Gas Flaring Reduction Partnership (GGFR):

The World Bank's Global Gas Flaring Reduction Partnership (GGFR) is a multi-donor trust fund composed of governments, oil companies, and multilateral organizations committed to ending routine gas flaring at oil production sites across the world, it's mission is Seeking a world free of routine gas flaring and venting,

GGFR advocates for ending routine gas flaring by garnering commitments for Zero Routine Flaring by 2030 Initiative (ZRF) (bank t. w., s.d.)

4.1.1 Zero Routine Flaring by 2030 Initiative:

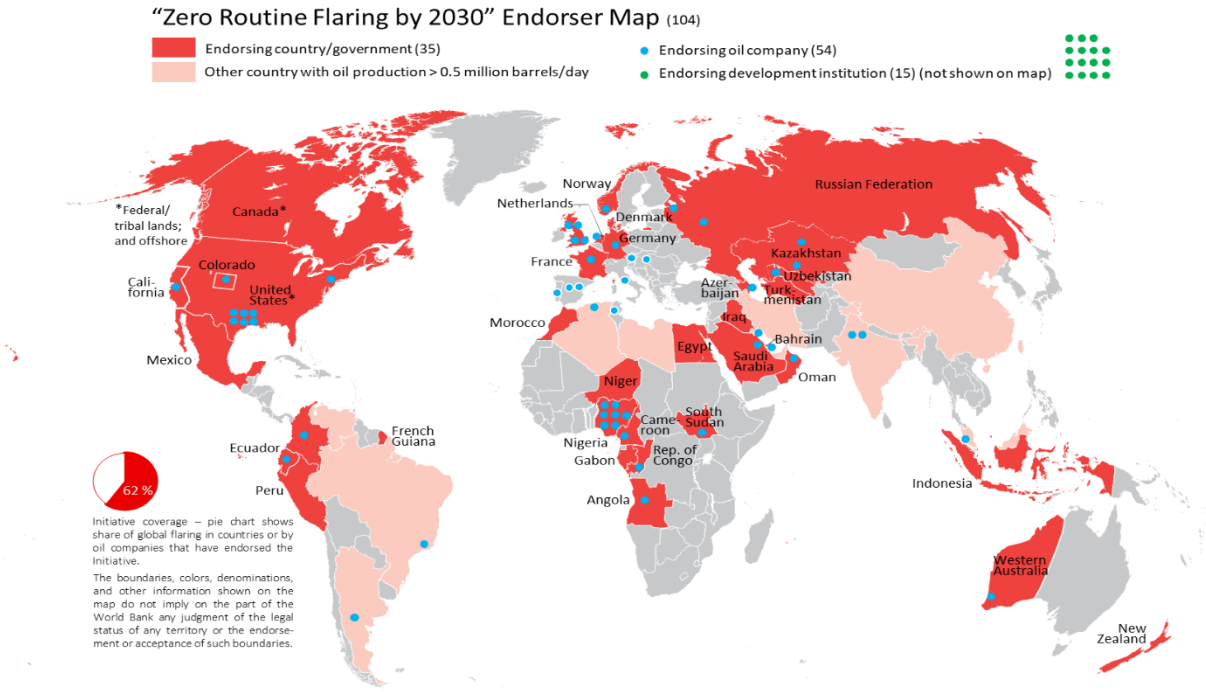
The initiative launched in 2015 by the UN Secretary-General and President of the World Bank, commits governments and oil companies, to end routine flaring no later than 2030. (bank t. w., About the "Zero Routine Flaring by 2030" Initiative, s.d.)

Algeria joined this imitative with its oil company SONATRACH in 2018; it commits to annually report flaring and progress towards the Initiative,

Algeria prohibits flaring and venting except under certain conditions, under the Law No. 19-13, 2019 and sonatrach have adopted a target of less than 1 percent of total associated gas to be flared by 2030. (bank t. w., GLOBAL FLARING AND VENTING REGULATIONS, 2021)

The figure below shows the countries and oil companies that participated in the ZRF initiative

Figure 02: endorsing government and oil companies under the ZRF Initiative



Source : www.worldbank.org/zeroroutineflaring

4.2 Renewable Energy Development Program :

The Algerian Renewable Energy and Energy Efficiency Development Plan was adopted in 2011 to increase the use of renewable energy sources and diversify the country's energy mix. The plan was initially set to be implemented in three stages, with a goal of installing 12,000 MW of renewable energy capacity by 2020. However, in 2015 the plan was updated to target 22,000 MW of renewable energy capacity by 2030. (Bouznit, 2020)

4.2.1 The National Fund for Renewable Energy and Cogeneration:

From a regulatory standpoint, the Ministry of Energy has implemented a series of supportive measures aimed at the development of grid-connected renewable energies. This involves the establishment of a favorable legal framework and a National Fund for Energy Management for Renewable Energies and Cogeneration, CAS No. 302-131 (FNMEERC). This fund is annually funded by 1% of the oil levy and proceeds from certain taxes, such as 55% of the flaring activities tax. (Mines, 2021)

All these initiatives make flaring tax a tool that goes beyond mere imposition, contributing to the enrichment of sustainable development goals

5. Case Study of the Hassi Bir Rekaiz Joint venture:

In this section, we will delve into a case study focusing on the Hassi Bir Rekaiz joint venture. We will explain what this group entails and simulate the flaring tax calculation process within this HBR joint venture

5.1 presentation of Hassi Bir Rekaiz Joint venture :

- **Joint venture:**

A joint venture (JV) is a form of business alliance between two or more companies. Often described as a "shared subsidiary," a JV is formed when two or more partners contribute a certain number of assets to an independent legal entity and are compensated proportionately to their contribution with the profits generated by that entity (Hesna, 2017)

- **hassi Bir Rekaiz Joint venture:**

The Hassi Bir Rekaiz joint venture. Is formed by SONATRACH and PTT Exploration Production Public Company Limited, on one side, and by ALNAFT on the other side.

This agreement is established with the aim of researching and exploiting hydrocarbons within the perimeter of 'Hassi Bir Rekaiz. It came into effect on 17/01/2010.

- **SONATRACH:**

Algerian national company for the exploration, exploitation, pipeline transportation, processing, and marketing of hydrocarbons and their derivatives. It is tasked with the mission of optimizing the national hydrocarbon resources and generating wealth for the economic and social development of the country (website, 2014)

- **PTTEP :**

PTTEP is a national petroleum exploration and production company dedicating to provide a sustainable petroleum supply to Thailand and the countries we operate as well to bring in foreign exchange earnings to Thailand. (PTTEP, s.d.)

- **ALNAFAT :**

A National Agency created in 2005. Where their Main missions are:

Promote the offshore and onshore domains; further, develop Algerian O&G upstream by attracting investments;

The agency ensures a rational management of the oil & gas resources and a harmonious development. (ALNAFT, 2018)

5.2 The calculation process of flaring tax at HASSI Bir Rekaiz consortium:

In this section, we will begin by determining the quantity of flared gas from PTTEP, through the authorization letters. Then, we will outline the indexed and updated flaring fee rates for the corresponding year. Finally, we will calculate the flaring fee

5.2.1 Determination of Flared Gas Quantity:

In this step, we will determine the quantity of flared gas based on the authorization letters, according to the following table:

Table N° 01: The quantity of flared gas by HBR JV

Well-ref	letter date	Authorisation letter ref	Min (Nm3)	Max(Nm3)	start date	end date	flared volume (Nm3)
BOG-15	20/02/2022	N°80/DEH/EP/ALNAFT/2022	8 000	8 000	24/02/2022	24/02/2022	19 432
REZ-1BIS	10/03/2022	N°112/DEH/EP/ALNAFT/2022	14 000	28 000	28/02/2022	01/03/2022	13 985
BOG-14	03/03/2022	N°94/DEH/EP/ALNAFT/2022	10 000	10 000	07/03/2022	07/03/2022	29 300
BOG-8ST2	23/02/2022	N°85/DEH/EP/ALNAFT/2022	20 000	20 000	13/06/2022	14/06/2022	23 916
BOG-7	25/08/2022	N°327/DEH/EP/ALNAFT/2022	10 000	10 000	06/09/2022	08/09/2022	23 032
BOG-9	25/08/2022	N°328/DEH/EP/ALNAFT/2022	10 000	10 000	18/09/2022	18/09/2022	6 160
BOG-6	20/09/2022	N°385/DEH/EP/ALNAFT/2022	10 000	10 000	23/11/2022	24/11/2022	19 551
BOG-4	23/02/2022	N°84/DEH/EP/ALNAFT/2022	12 000	12 000	09/12/2022	11/12/2022	14 729.75

Source: Internal documents of the Hassi Bir Rekaiz JV

Interpretation:

According to the table below, we observe that PTTEP has conducted eight flaring operations based on the authorization letters issued by ALNAFT. The commencement

date of flaring was on 24/02/2022, with a minimum estimated quantity of 8000 Nm3 and a maximum quantity of 8000 Nm3. The actual flared quantity was 19,432 Nm3.

The date of the last operation started on 09/12/2022 and ended on 11/12/2022, with a minimum estimated threshold of 12,000 Nm3 and a maximum of 12,000 Nm3. The actual quantity flared was 14,729.75 Nm3.

5.2.2 the application of tax fee:

The tariff for the flaring tax for the year 2022 was 12,000 DZD according to ALNAFT. In this section, we will present the Indexed and Updated Tariff for Flaring Tax from ALNAFT for the year 2022, as shown in the table below

Table N°02: the Indexed and Updated Tariff for Flaring Tax by ALNAFT

Contract/Scope	Ref.	Date	The flared quantity (10 Nm3)	Indexed and Updated Tariff
Hassi Bir Rekaiz	N°80/DEH/EP/ALNAFT/2022	20/02/2022	19 432,00	13437
Hassi Bir Rekaiz	N°112/DEH/EP/ALNAFT/2022	10/03/2022	13 985,00	13437
Hassi Bir Rekaiz	N°94/DEH/EP/ALNAFT/2022	03/03/2022	29 300,00	13437
Hassi Bir Rekaiz	N°85/DEH/EP/ALNAFT/2022	23/02/2022	23 916,00	13437
Hassi Bir Rekaiz	N°327/DEH/EP/ALNAFT/2022	25/08/2022	23 032,00	13437
Hassi Bir Rekaiz	N°328/DEH/EP/ALNAFT/2022	25/08/2022	6 160,00	13437
Hassi Bir Rekaiz	N°385/DEH/EP/ALNAFT/2022	20/09/2022	19 551,00	13437
Hassi Bir Rekaiz	N°84/DEH/EP/ALNAFT/2022	23/02/2022	14 729,75	13437

Source: Internal documents of the Hassi Bir Rekaiz JV

Interpretation:

The Indexed and Updated Rate is calculated by multiplying the base rate indexed at the beginning of the year 2022 (which is indexed and operated by the ALNAFT agency based on the annual American index) ,which was 12868 Algerian dinars (DZD) by the Actualization Coefficient TCM sale ($/OA)/80.

This coefficient refers to the base indexed rate based on the previous calendar month's TCM sale of the US dollar in dinars, as published by the Bank of Algeria, divided by 80, which equals 1.0442. As shown in these illustrative calculations:

Figure 04: The formula for calculating Indexed and updated tariff

Indexed and updated tariff = Base Rate Indexed as of January 1st * Discounting Factor (TCM) sale

Source: Prepared by the author based on internal documents of the Hassi Bir Rekaiz JV

Indexed and updated tariff= 12868*1. 0442= 13437

Note: This tariff is fixed for all processed volumes

5.2.3 calculation of flaring tax :

This step is the final one, allowing us to calculate the torching tax amount corresponding to the torching operations carried out in the year 2022, as indicated in the following table

Table N 03: the flaring tax amount of Hassi Bir Rekaiz JV

Well	The flared quantity (10 Nm3)	Indexed and Updated Tariff	tax amount
BOG-15	19 432,00	13437	261 108
REZ-1BIS	13 985,00	13437	187 916
BOG-14	29 300,00	13437	393 704
BOG-8ST2	23 916,00	13437	321 359
BOG-7	23 032,00	13437	309 481
BOG-9	6 160,00	13437	82 772
BOG-6	19 551,00	13437	262 707
	150105.75		2016970.96

Source: Internal documents of the Hassi Bir Rekaiz JV

Interpretation:

The following table presents the overall torching tax amount owed by the GHBR consortium, which amounts to 2,016,970.96. To calculate this amount, we began by determining the quantities of gas torched for each well and the tariff applied for the year 2022. The final step involves calculating the total tax amount, which can be done using two methods, as per the following formulas:

Method 1:

Figure 05: The formula for calculating Total flared Tax Amount method 01

Total Tax Amount = Σ (Quantity of Gas Torched for Each Well * Tariff Applied for 2022 for Each Well)

Source: Prepared by the author based on internal documents of the Hassi Bir Rekaiz JV

Method 2:

Figure 06: The formula for calculating Total flared Tax Amount method 02

Total Tax Amount = (∑ Quantity of Gas Torched for Each Well) * (∑Tariff Applied for 2022)

Source: Prepared by the author based on internal documents of the Hassi Bir Rekaiz JV

Total tax amount method 01 = ((19 432, 00 * 13437) + (13 985, 00 * 13437) + (29 300,00 * 13437) + (23 916,00 * 13437) + (23 032,00 * 13437) + (6 160,00 * 13437) + (19 551,00 * 13437) + (19 551,00 * 13437))= 2016970.96

Total tax amount method 02 = (150105.75 * 13437) = 2016970.96

6- Conclusion:

In conclusion, this study has provided a comprehensive analysis of the fiscal aspects of the Flaring Gas Tax in Algeria. The Flaring Gas Tax represents a significant fiscal measure aimed at reducing the wasteful practice of flaring natural gas during oil extraction. Through a combination of qualitative and quantitative research methods, we have delved into the intricate details of this tax and its practical implications.

One of the key findings of this research is the annual nature of the gas flaring tax, with its amount determined each year and published in the Algerian Official journal. The requirement for a license issued by the National Oil Agency ALNAFT for each flaring operation ensures that the quantity flared is accurately calculated, further emphasizing the government's commitment to environmental and economic sustainability.

The gas flaring tax in Algeria has been a successful policy in reducing gas flaring and promoting sustainable development. The tax has incentivized companies to invest in gas capture and utilization projects, which has led to a significant reduction in gas flaring emissions. The tax has also generated significant revenue, which has been used to fund renewable energy projects and other sustainable development initiatives.

On the practical front, the case of Hassi Bir Rekaiz consortium acquiring permits for gas flaring in 2022 highlights the real-world application of the Flaring Gas Tax. The estimated tax value serves as a tangible example of how this fiscal measure functions in practice, with implications for both the oil industry and the national economy.

This study contributes to a deeper understanding of the Flaring Gas Tax and its role in promoting responsible resource management and environmental stewardship in Algeria's energy sector.

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