Eliminating flaring and accelerating the transition: a practical roadmap for Algeria

From: oil and gas focussed economy and exports → **To: diversified energy hub**

A thought piece by capterio

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Executive summary

- **As the world's 5th largest gas flarer, Algeria has much to gain from cleaning up its oil and gas industry – and reducing gas flaring. It's after all a "code red" country for gas flaring today. By reducing gas flaring, Algeria could create revenues that could be re-invested into low carbon sources of energy and play a major role in the energy transition.**

- **But whilst there is a growing realisation of the need to reduce gas flaring, some critical reforms are needed to accelerate action around the six areas of leadership, roadmap definition, data transparency, penalty enforcement, contractual overhaul and third-party capital.**

- **Algeria has a limited window of opportunity to act, create value and lead the industry. Plan B – more of the same – will have dramatically negative consequences, leading to a loss of revenue, competitiveness and continued decline. It doesn't have to be that way.**

Introduction

As the world's 5th largest gas flarer (at 9.3 Billion Cubic Metres per year (900 million scf per day, or 10% of gas production, according to a World Bank report), the practice must be eliminated. Flaring not only leads to a loss of revenue (flaring equates to 1% of GDP), but also the damage to the environment (flaring generates 150 million CO2-equivalent tonnes[1]) and damages Algeria's international reputation (discouraging international investment).

The stakes are high, also because the major international buyers of Algeria's oil and gas are moving to impose a carbon border price adjustment (see our article *"gas flaring threatens Algeria's energy exports to Europe"*). If the EU were to impose a carbon price of $50 per tonne, Algeria's gas could be around 50% more expensive (adding up to $2.6 per mmbtu of gas sold), putting billions of dollars of export revenues at risk (see our article "*how the EU's CBAM could impact energy imports*").

And now, more than ever, Algeria needs to monetise every molecule. After all, the "backstory" behind the so-called politically-led non-renewal of piped gas from Algeria to Morocco is simple: Algeria is running out of gas. Domestic consumption is up and exports are down. This is very concerning trend, especially when gas prices are so high. But it doesn't have to be this way – and capturing wasted flare gas could make a dramatic difference.

[1] Here we assume a 10% methane slip and a "global warming potential" of methane being 84x that of CO2 on a mass basis, according to the IPCC.

So, what if Algeria plays its cards right and moves to seize the window of opportunity by capturing flared gas? In that case, it can not only create real value and dramatically improve its investment climate, but also create a new revenue source that could be directed towards building a solar- and wind-based economy exporting electrons and e-fuels such as hydrogen and ammonia into the EU and beyond. Now, that's a great opportunity!

Material reductions in gas flaring will, however, require substantial changes to the current operating models in Algeria. Many visionary statements, targets and commitments have been made – and missed. We don't need more lofty statements that don't deliver, or more reiterations of commitments to the World Bank "Zero Routine Flaring" by 2030 programme. Now is time for policies, mandates, regulations and execution.

We outline how this could happen. In doing so, this paper builds on our paper "*critical outcomes from COP26 on "code red" gas flaring countries*".

Recap of the current flaring in Algeria

Algeria's 9.3 BCM per year comes from around 200 discretely resolvable flaring sites across the country. The top 11 assets shown in Figure 1 contribute over 52% of the flaring volume. The fields tend to be of 2 types: (a) those such as Hassi Messaoud, Alrar and which are 100% Sonatrach owned and operated, and those such as Tin-Fouye-Tabankort (TFT), which have complex ownership. The TFT field, for example, is divided into an "oil rim" (which has very large flaring of associated gas) and a condensate/gas "cap" which is owned by 2 IOCs (Repsol and TotalEnergies) plus Sonatrach. This ownership complexity is an underlying core driver of the economics of flaring solutions, as discussed below.

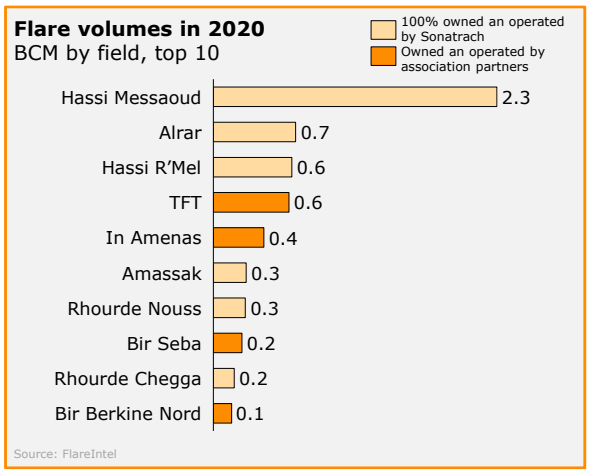

Figure 1: Top 10 flaring fields in Algeria in 2020, according to FlareIntel. FlareIntel incorporates data from VIIRS Nightfire (VNF) nightly data produced by the Earth Observation Group, Payne Institute for Public Policy, Colorado School of Mines.

An illustrated example

To get specific, Figure 2 has the flaring profile for another excellent flare capture project we proposed 3 years ago. The sites we identified have been flaring since 2012 with a rate increasing by 2% per year. Here, FlareIntel Pro (Capterio's real-time flare-tracking tool) has been instrumental in demonstrating how a compelling investment case can be created by aggregating clusters of nearby flares (potentially with different operating partners) and evacuating the recovered gas and associated liquids through

existing infrastructure. The opportunity today is to reduce flaring (by 40 million scf/day), create revenue (up to $60 million per year) and reduce emissions (by up to 3 million CO2-equivalent tonnes per year), and accelerate the energy transition.

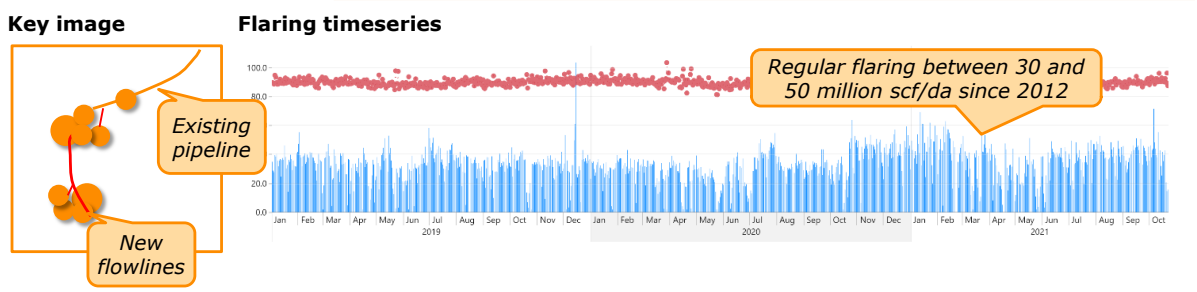

Figure 2: Flaring in a region within the desert in Algeria, averaging some 40 million scf/day. By aggregating up to 9 flares, the National Oil Company operator has an attractive flare capture opportunity that could generate revenues up to $60 million per year (from sales of gas, condensate and NGLs).

In this case, the state-backed National Oil Company holds not only the opportunity (the flares are predominately on assets in which it has 100% equity), but also holds the key to its resolution (a controlling influence on the nearby infrastructure, including a processing facility operated in partnership with well-known IOC operators). To deliver this project, we estimate that only $30-50 million of CAPEX is required to add equipment to separate and compress the gas and to install less than 20 km of additional pipeline.

We hope that FlareIntel Pro raises the profile of these kinds of emission reduction opportunities; indeed, it is partly for this reason that we launched FlareIntel free and to bring flaring at such assets into the public domain.

So, why do we flare?

We outlined in a previous article the main reasons why operators flare. Put simply, they are because: (a) flaring is "not on the radar" enough of the producing companies, their regulator and the government, (b) there is a historical belief that flaring cannot be solved economically, without significant additional costs, and (c) that there is insufficient capital and/or capability to address it.

Yet in today's world, each of these reasons are no longer true. With the advent of flare tracking services (such as FlareIntel's free flare tracker), lower-cost solutions and the rise of more ESG-minded investors, each of these issues can be addressed – and flaring can be reduced.

Capterio's analysis has highlighted that in Algeria, over 4.7 BCM (or 51%, representing almost $1 billion per year of revenue potential) is within 10 km of an existing gas pipeline (many of which have spare capacity). And whilst there is a perception that the "latest and greatest" technologies are required (at great expense) to capture flared gas, we think this is far from the mark.

Indeed, there are many opportunities to deploy "simple" solutions such as (a) capture the flared gas to power local operations (and therefore reduce diesel), (b) tie the gas into the nearby gas pipeline (building additional trunklines if required), and (c) recover condensate and LPG – see Box 1 for more details.

Box 1: Technology recap

Flaring solutions are many and include use for local operations or market-based monetisation.

Local operations examples include reinjection for enhanced oil recovery, storage or disposal or using the gas to generate electricity for oilfield operations.

Market-based solutions include: sending the gas to an existing gas pipeline, transporting the gas via a "virtual pipeline" to the market (as either CNG or LNG), generating power for the grid, or generating value-add products (including petrochemicals, fertilisers, synthetic proteins or food e.g. via "vertical farming".

The authors have studied many flare capture opportunities in Algeria over the last 3 years. For the most part, flares in Algeria do not require the latest-and-greatest technologies. Instead, they only require simple and proven solutions such as gas processing and compression and transport only are required. The problem of gas flaring, is fundamentally, therefore, not a technical issue – rather it is one of leadership, investment and execution.

We have evaluated in great detail a range of flare capture projects in Algeria and confirm that many make highly-attractive investments that reduce flaring, create value and help Algeria to play a role to accelerate the energy transition.

What needs to change to dramatically reduce gas flaring in Algeria?

Based on our extensive on-the-ground discussions with government, regulators, producers and service companies, we identify six major change levers. Significant change is a collaborative effort and will require new and broader partnerships.

1. Vigorous and **committed top-down leadership** from the government, the Energy Minister and the CEO of Sonatrach and the formation of a "National Flaring Taskforce".

2. Define and execute a **nationwide programmatic "flare reduction roadmap"** with a clear mandate**.** The programme below could start with 1-3 pilot projects which generate $15-25 million per year within 12-18 months.

3. Radical **step-change in transparency** with public reporting of flaring volumes and progress on their elimination. New transparency tools are leading the way.

4. Dramatic **improvement in enforcement by the regulator** and collection of flaring penalties, based on the newly-approved New Hydrocarbon Law.

5. **Overhaul and/or improve the commercial contracts** that govern the management of oil and gas fields, to encourage improved coordination between players.

6. Encouragement and **attract third-party capital** and players that bring capabilities and expertise.

We expand on each proposed lever below.

1: Committed leadership

Change must be led by the top, and gas flaring – which has long been recognised must now be viewed as a mission-critical strategic priority. A new national Flaring Taskforce comprising of senior leaders from the regulator (ALNAFT), the NOC (Sonatrach) and the electricity industry (Sonelgaz) should report to the Minister of Energy Transition, the Minister of Energy and parliament on a quarterly basis. Sonatrach must set up a dedicated team reporting directly to its CEO.

2: National flaring roadmap

Algeria needs a clearly prioritised national "roadmap" to reduce flaring. Key stages are: (i) define a clear inventorisation of the flaring challenge, (ii) develop a high-level development action plan which prioritises initial investment opportunities and pilot projects, and then: (iii) roll out a programme nation-wide, supported by clear KPIs and a rapid learning cycle based on sharing of best practices.

3: Data transparency

Flaring data for every field should be reported and be made public on a monthly basis, similar to the UK's "Flaring Emissions Benchmarking" dashboard. Reported data should be cross-checked with those derived by satellite, and if the reported figures missing or likely inaccurate, satellite data should be the default. FlareIntelPro, a tool developed by Capterio, enables operators to track their flaring in real-time. There is also a free version available at www.flareintel.com.

And given that many flares have inefficient combustion (leading to significant volumes of "methane slip"). A significant number of flares in Algeria regularly appear to be "venting" to atmosphere (with dramatically-higher climate-forcing impact). Reporting on venting needs also to be transparent, back-up by field data.

4: Penalty enforcement

Since at least 2005, the law has been clear: gas flaring is forbidden unless the regulator ALNAFT has given a time-limited specific exemption, and penalties otherwise due.

These flaring penalties have recently increased to 12 dinars per cubic metre (equivalent to $2.5 per mmbtu, of $48 per tonne of CO2), and are in the middle of Nigeria and Norway's penalty rates ($38 per tonne of CO2 and $61 per tonne of CO2 respectively). Yet – to the best of our knowledge, the level of penalties paid are not even close to the $830 million per year implied by flaring at 9.3 BCM per year. Enforcement needs to be stepped up, penalties collected, and published.

5: Contract overhaul

We advocate here that the current contractual models in Algeria need to overhauled to encourage coordination between different contractual entities to enable optimisation and investment for the "greater good" rather than for the individual contract owners. The government should look for creative solutions, such as field "unitisation", and should consider creating an improved commercial framework (with reduced government take) specifically for *ring-fenced* flare capture projects.

Box 2: Illustrated example of a typical contractual challenge today

To illustrate the coordination challenge, let's take the example of the TFT field. Like many other fields, the "oil rim" (which flares the major of the field's associated gas) is 100% Sonatrach owned, whereas the gas/condensate "cap" (which has limited flaring) is operated by an association including TotalEnergies, Repsol and Sonatrach. The association partners operate a gas "central processing facility" (which has significant spare capacity) and is on a gas export line.

Since the equity partners are different, each party naturally optimises in its own interest, rather than the interest of the whole. And since Total/Repsol have no entitlement to Sonatrach's gas there is (currently) very little commercial interest to invest. Yet ironically, fields with this structure have a ready solution – the gas can be processed at the existing gas/condensate processing facilities, most of which have significant spare capacity. Every actor has much to be gained by taking a new approach, however, without a shared vision (and incentive) it can be hard to align incentives.

6: Attract third-party capital

To solve gas flaring, Algeria needs significant capital investment. But the state is heavily capital constrained (Sonatrach's budget was cut by 50% as a result of the COVID-induced oil crisis), and the limited capital is inevitably prioritised to major projects such as the Hassi Messaoud oilfield.

The solution is, of course, for the state to look for new players who can bring capital, new ideas, new operating models and expertise and deliver on-the-ground flare capture solutions. Fortunately, Algeria's New Hydrocarbon Law supports new contractual relationships such as a "participation contract" and a "risk services contract" in addition to the conventional "production sharing contract". Specialist flare capture companies are already actively working in this field.

Algeria has all to play for, and by committing to a radical new programme supported by these 6 levers, material progress can be made to reduce gas flaring. The alternative ("Plan B") of "more of the same" would lead to a severe reduction in international exports and major hesitation by international investors to bring foreign capital into Algeria. The moment to act is now – we need bold and inspirational leadership to make it a reality.

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