Gas Flaring: A Field-by-Field and Province-by-Province Analysis in Iraq and the Kurdistan Region

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Summary : In 2023, 214 oil production fields and oil refinery locations were identified in Iraq and the Kurdistan Region that had high temperature and carbon dioxide emission density levels, which was a result of the burning of associated gas from these locations. During field visits to these sites located in the governorates of the Kurdistan Region, it was observed that the amounts reported in the data reflected the intensity and density of the flames from the pipes that were installed for burning the gas.

Overview

In the past decade, the amount of associated gas flared in Iraq and the Kurdistan Region has increased by over 39%. Despite all efforts to reduce it, according to the latest report by the World Bank and Sky Truth on global gas flaring, the amount still exceeds 18.02 billion cubic meters per year.

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Despite the efforts of both the Iraqi government and the Kurdistan Regional Government to reduce the amount of associated gas flaring from oil fields, the Ministry of Oil has indicated that it wants to invest in 70% of the amount of gas that is burned annually. However, despite all the signed contracts and investments of previous years, more than 30% is still being burned.

The financial losses from the burning of this gas in Iraq and the Kurdistan Region, it amounts to over 2.7 billion dollars annually, with Basra province alone accounting for 1.5 billion dollars, followed by Maysan and Kirkuk. At the level of the Kurdistan Region provinces, the amount of money wasted annually due to associated gas flaring in Erbil alone exceeds 120 million dollars.

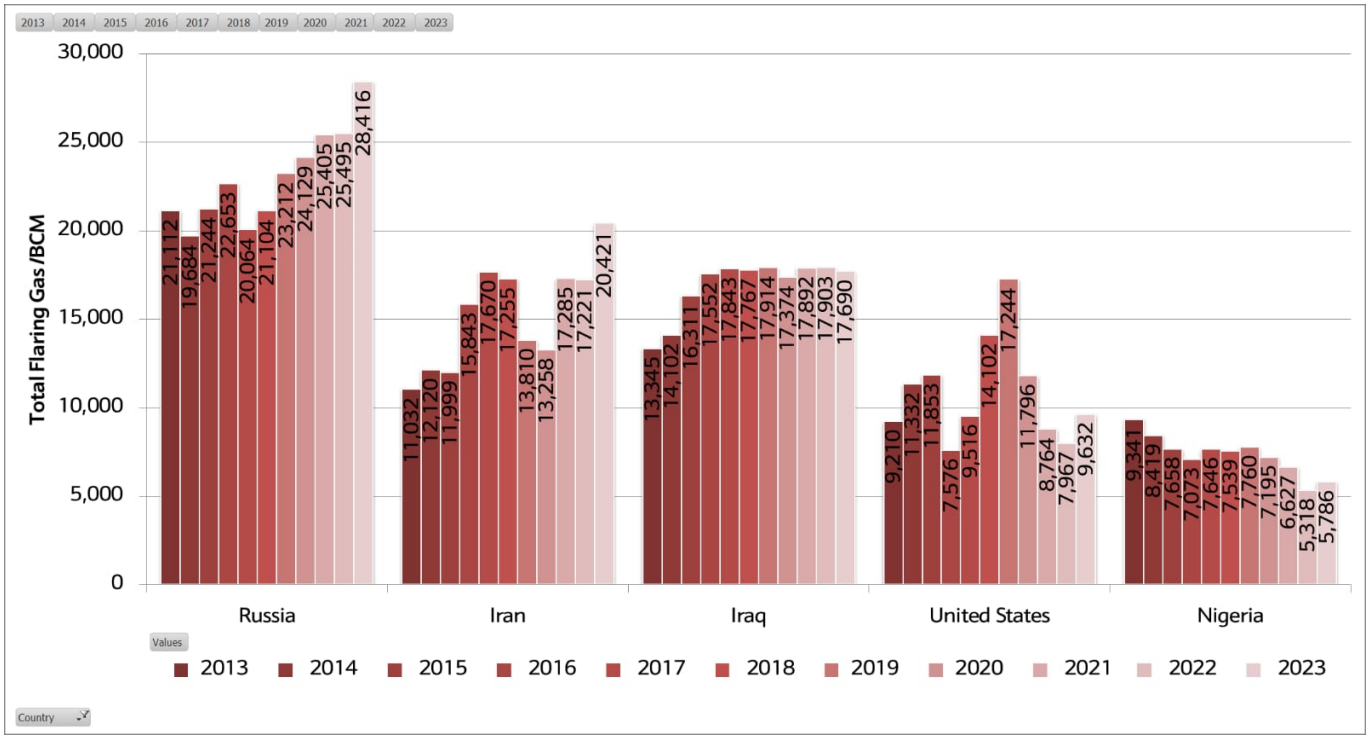
Another aspect of associated gas flaring is the emission of carbon dioxide or greenhouse gas, which is identified as black carbon and is considered one of the main contributors to global warming and increasing causes of air pollution. Out of approximately 350 million tons of carbon dioxide that is released into the air annually due to associated gas flaring, 46 million tons came from Iraq. This means that one-seventh of carbon dioxide emissions that originate from gas flaring come from Iraq and the Kurdistan Region.

Latest Global Rankings of Associated Gas Flaring: Where Does Iraq Stand?

During the years 2013 to 2022, Iraq was in second place in the world ranking of countries for associated gas flaring from oil production and crude oil refineries. However, according to data from the Central Bank, in 2023 Iran surpassed Iraq and took the second position with 20.4 billion cubic meters, while Iraq dropped to third place by burning 18.02 billion cubic meters that year.

According to the data, in 2013 Iraq burned 13.3 billion cubic meters of associated gas, but after one decade the amount has reached 17.6 billion cubic meters just from oil production because oil production has increased and 75% of Iraq's gas is in the form of associated gas, not free gas. Therefore, any plan to increase oil production, which Iraq intends to raise to 7 million barrels per day, also means increasing the amount of associated gas flaring if new methods are not adopted.

Graphic 01: Flaring amount of associated gas in the top five countries in the world from 2013 to 2023



Source: World Bank Data on Associated Gas Flaring, 15-3-2025, Sky Truth 2-4-2025.

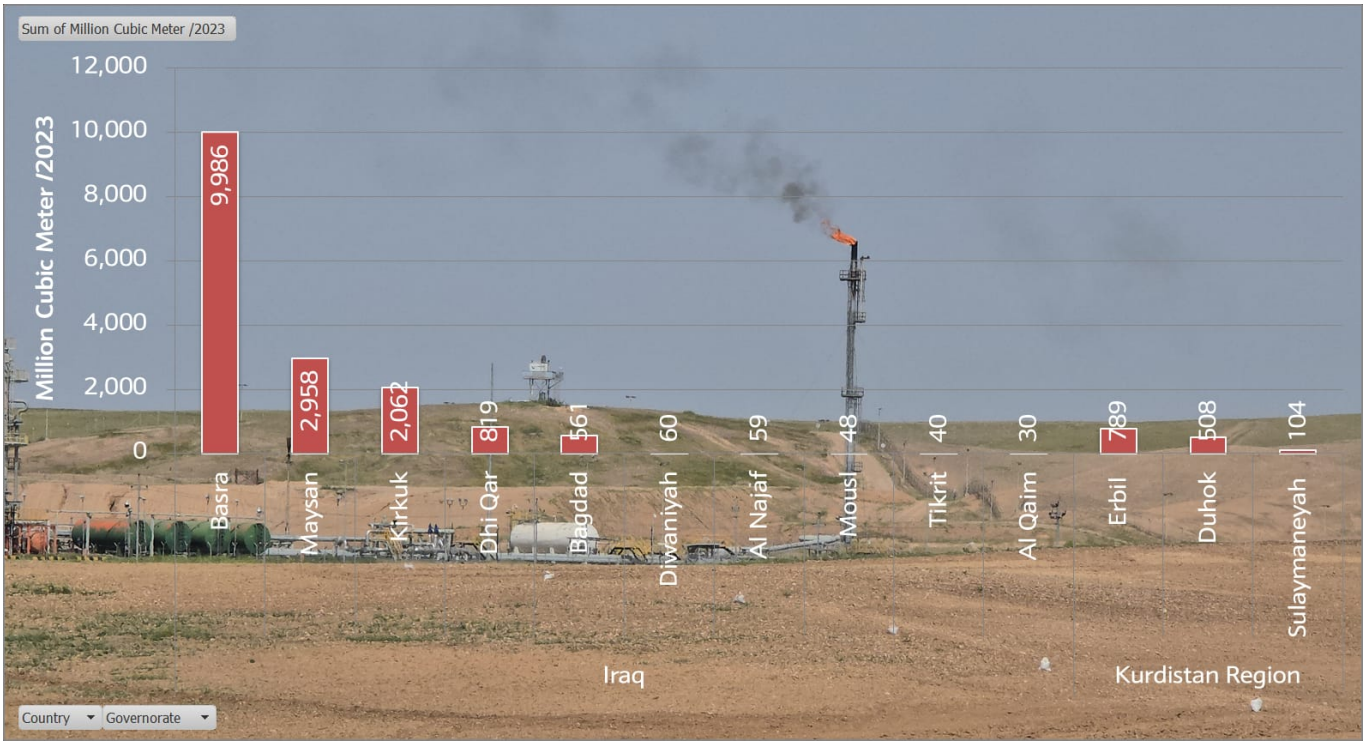
Annual Gas Flaring Volumes in Iraq's Provinces and the Kurdistan Region

Annually, associated gas is flared in varying amounts across the provinces of Iraq and the three provinces of the Kurdistan Region. As shown in the first graphic, the amount in Basra province in 2023 reached 9.9 billion cubic meters, in Maysan province 2.9 billion cubic meters, and in Kirkuk 2 billion cubic meters. Additionally, at the Kurdistan Region level, the amount in 2023 was 1.4 billion cubic meters, with 789 million cubic meters in Erbil, 508 million cubic meters in Dohuk, and 104 million cubic meters in Sulaymaniyah.

According to agreements and project implementations in this sector, the trend of associated gas flaring should have been decreasing, but because oil production has been rising, gas flaring has also increased. In 2013, the amount of oil produced was 3 million and 99 thousand barrels daily, and associated gas flaring amounted to 13.3 billion cubic meters. However, when oil production reached 4.3 million barrels of oil in 2023, associated gas flaring also rose to 18.02 billion cubic meters.

According to data from the Iraqi Deputy Minister of Oil for Gas Affairs at the Erbil Forum 2025, "in the past decade, the amount of associated gas that has not been flared and has been successfully invested in increased by 09% from 2021 to 2023. This means that in 2021, out of a total of 2969 million cubic feet per day, 1562 million cubic feet per day was utilized while the rest was flared. However, in 2023, out of a total of 3123 million cubic feet per day, 1934 million cubic feet per day was utilized, and the amount flared and wasted has decreased. But according to World Bank data, as well as other centers such as Sky Truths, the amount of associated gas flaring has not decreased at that rate, and during this period the reduction was only by 1%.

Graphic 02: Amount of associated gas flaring in the provinces of Iraq and Kurdistan Region


Sum of Million Cubic Meter /2023
Million Cubic Meter /2023
12,000
10,000
8,000
6,000
4,000
2,000
0
9,986
2,958
2,062
819
561
60
59
48
40
30
789
508
104
Basra
Maysan
Kirkuk
Dhi Qar
Bagdad
Diwaniyah
Al Najaf
Mousl
Tikrit
Al Qaim
Erbil
Duhok
Sulaymaneyah
Iraq
Kurdistan Region
Country
Governorate

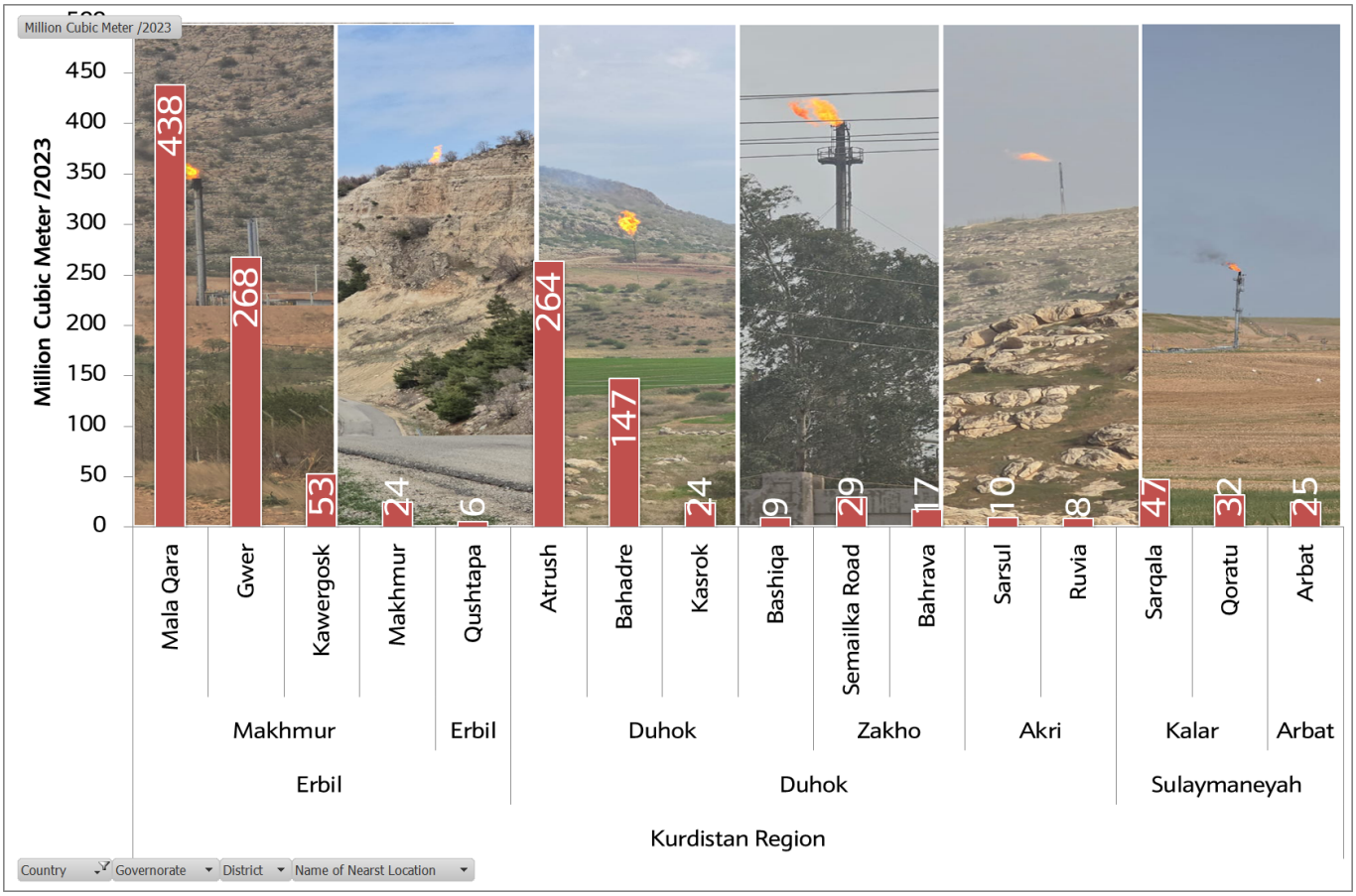
Source: World Bank Data on Associated Gas Flaring, 15-3-2025, Sky Truth 2-4-2025.

The number of locations that are oil fields and refineries in the Kurdistan Region where associated gas is flared daily reaches 45 sites, with nearly half in Erbil Governorate at 22 sites, 20 sites in Duhok, and 3 sites in Sulaymaniyah.

The total amount of gas burned annually reaches 1.4 billion cubic meters. In Erbil Governorate, the highest amount is in Makhmour district and both Mala Qara and Gwer areas. In Duhok Governorate, the highest amount of flared gas is from the Atrush and Sarsang oil fields, which annually reaches 263 million cubic meters, followed by the Baadre oil field at 146 million cubic meters annually.

At the Sulaymaniyah Governorate level, of the three locations where associated gas is flared, two are oil fields and one is a new oil refinery on the Arbat Road. Although investment has been made in the Sarqala oil field since 2020 to reduce associated gas flaring and utilize the gas produced with oil to operate a 165-megawatt power station and utilize 40 million cubic feet of associated gas per day, which means reducing carbon dioxide emissions by 840 tons per day. Additionally, oil production at the Chia Surkh oil field has been suspended for more than a year, and associated gas flaring there has stopped. However, according to World Bank data, the amount flared in 2023 within Sulaymaniyah Governorate was 47.31 million cubic meters at the Sarqala oil field and 24.5 million cubic meters at the Focus refinery, as shown in the graphic below.

Graphic 03: Associated Gas Flaring in Oil Fields and Refineries in the Kurdistan Region / 2023



Source: World Bank data on gas flaring, 15-3-2025, Sky Truth 2-4-2025.

Note 1: The images in this graphic show oil fields in the Kurdistan Region taken during the days of March 18 and 19, 2025, and April 3, 2025.

Note 2: Among all the sites identified by satellite as locations of associated gas flaring, two fields currently have zero production levels and are completely shut down, such as Erbil Oil Field and Chia Surkh.

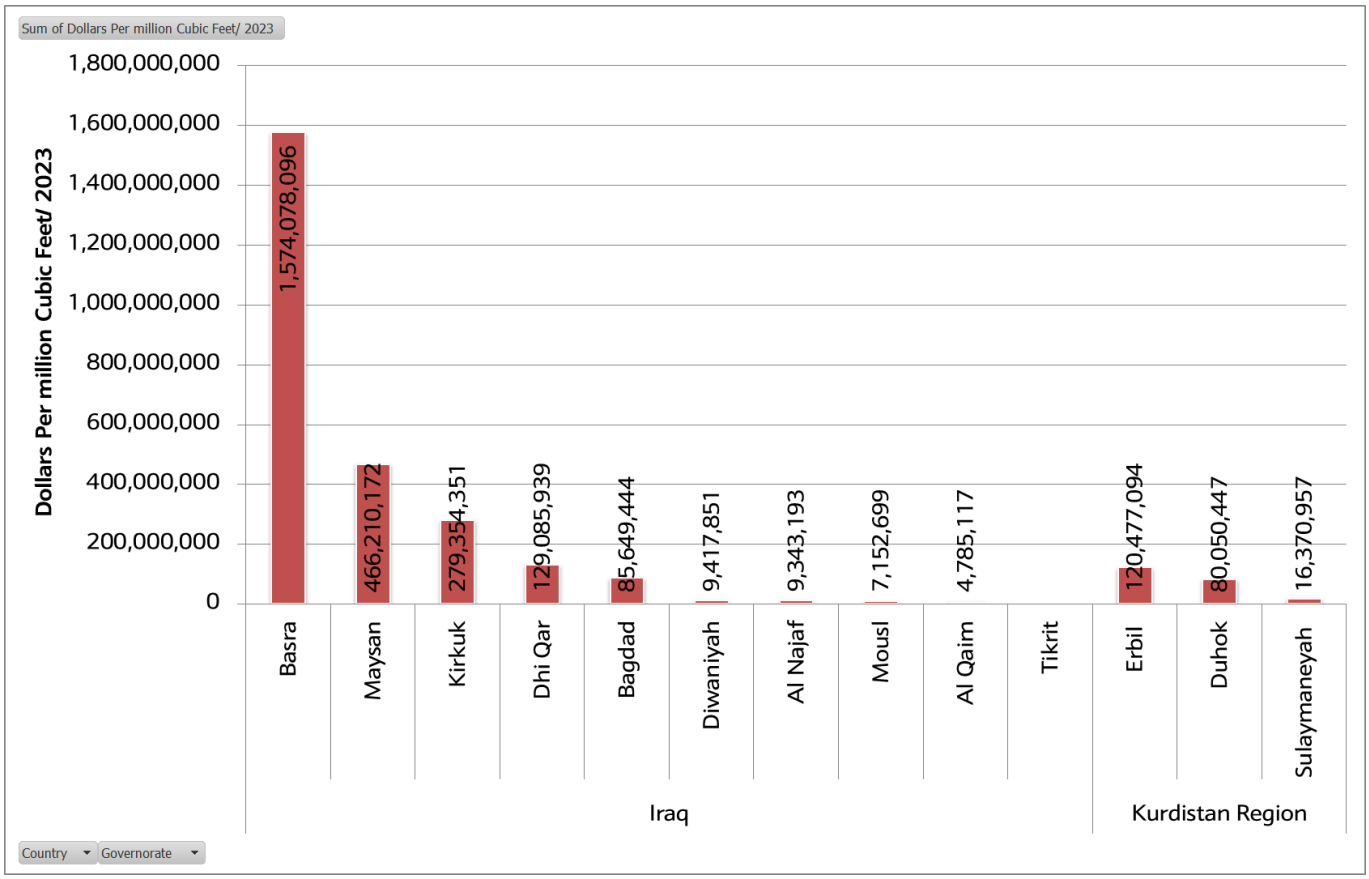
The Financial and Environmental Costs of Continued Associated Gas Flaring

If we calculate the value of one thousand cubic feet of gas at industrial market prices, the annual financial losses from associated gas flaring in Iraq and the Kurdistan Region amount to $2.78 billion, with Iraq accounting for $2.56 billion and the Kurdistan Region accounting for $216 million.

From another perspective, Iraq hasn't only suffered this amount of loss, as the Iraqi Deputy Minister of Oil for Gas Affairs stated at the Erbil Forum: "The damage from gas flaring is three times greater, because we have to import it at double the price, and there is even more environmental damage beyond that."

Furthermore, if we analyze the total losses at the provincial level, in Basra Province they reach $4.3 million daily, and in Erbil Province they reach $342,000 daily. This flaring occurs while Basra suffers from a lack of basic services and Erbil is struggling with increasing levels of air pollution in the city.

Graphic 04: The total amount of money Iraq and the Kurdistan Region waste annually due to gas flaring



Source: World Bank data on associated gas flaring, 15-3-2025, Sky Truth 2-4-2025.

Note 1: Here, the amount of flared associated gas is calculated at the price of US commercial gas for 2023, which is set at an average of $4.463 per 1,000 cubic feet.

Continuing to emit 46 million tons of carbon dioxide in the era of climate change accelerates the manifestation of climate change that Iraq is currently experiencing, such as the increase in dust storm days per year, decreased rainfall and

increased annual drought cycles, reduction of river and stream water levels and the disappearance of stream and pond waters, increased desertification and decreased forests, and above all, the shortening of winter duration and an increase in days where temperatures exceed 50 degrees Celsius.

In fact, a major reason why air quality in Iraq and the "Kurdistan Region" is ranked among the worst countries in the world, holding the 13th position for daily air pollution and placing among countries like Chad, Pakistan, and Rwanda, is due to carbon dioxide emissions, with one-quarter of these emissions annually originating from associated gas flaring.

Generally, air pollution in the provinces of Iraq and the Kurdistan Region is 8 times higher than the global standard. According to World Health Organization standards, the concentration of polluting particles in the air should not exceed five micrograms per cubic meter; however, the concentration in Iraq has reached 74 micrograms per cubic meter.

According to a scientific study by Rice University and the Clean Air Task Force in Boston[i], USA, flaring associated gas from oil production causes the emission of black carbon, which is one of the main sources of health deterioration for residents in nearby areas and contributes to climate warming in these regions.

Graphic 05: Carbon dioxide emission amounts by provinces in Iraq and the Kurdistan Region

Source: World Bank data on associated gas flaring, 15-3-2025, Sky Truth 2-4-2025

Note 1: The image was taken on March 18, 2025, at one of the oil fields near Erbil.

Note 2: The amount of carbon dioxide emissions from associated gas flaring has been calculated according to the World Bank, where 1 cubic meter of flared associated gas equals the emission of 2.6 kilograms of carbon dioxide.

Ongoing Associated Gas Flaring and the Preparation of Gas Fields for Investment

According to data from the Iraqi Ministry of Oil at the Erbil Forum 2025, "Iraq has not invested in gas for four decades because out of a total of 127.3 trillion cubic feet of gas reserves, of which 97.7 trillion cubic feet exists as associated gas, it has not been able to meet domestic needs.

According to the data, in June 2024, production levels reached 2,183 million cubic feet per day, with plans to reach 2,783 million cubic feet per day by the end of 2026, and if projects are implemented, to reach 6,133 million cubic feet per day by the end of 2036."

Also, last year Iraq burned 1,121 million cubic feet per day of associated gas, which represents 33% of the total associated gas produced from oil. Another point, according to data from the Iraqi Deputy Minister of Oil for Gas Affairs, the total investment that will be implemented by the end of 2026 will amount to 600 million cubic feet per day, and by the end of 2036, the amount will reach 3,350 million cubic feet per day. Of this increase, only 900 million cubic feet per day will come from oil fields, while the rest will come from gas fields.

Also, we should not overlook that the Kurdistan Region's story regarding associated gas flaring and investment in gas fields is completely different from Iraq and even other countries in the region, because the Kurdistan Region has three successful examples of reducing associated gas flaring and investment in gas fields. All this is happening while out of a total of 10 gas fields and combined oil and gas fields in the Kurdistan Region, investment for gas production has only been made in four fields.

Another example of the Kurdistan Region's success in gas investment compared to Iraq is the Khor Mor and Chamchamal gas project, as it is planned to increase investment by 500 million cubic feet per day in the first quarter of 2026, while the total Iraqi projects in this sector that will come into being by the end of 2026 amount to 600 million cubic feet per day. One of the notable examples is DNO's project to reduce associated gas flaring. According to statements from DNO company and the FlareIntel[iii] report, "Due to investment in associated gas at the Peshkabir field, they have been able to reduce gas flaring by 20 million cubic feet," which means reducing gas flaring from 30 million cubic feet to 10 million cubic feet and decreasing carbon dioxide emissions by 478 thousand tons per year.

Now, Iraq and even the Kurdistan Region are directing investment in this sector toward new fields rather than those fields that are currently flaring associated gas. For example, in the fifth plus and sixth rounds, out of 27 fields prepared for investment, 11 were gas fields and 5 were joint "oil and gas" fields.

Also, in recent days, Dana Gas and Crescent Petroleum, which operate in the Kurdistan Region's gas sector, confirmed the same thing in a statement when they indicated that "their partners have approved $160 million for rapid exploration and initial development of the Chamchamal gas field, along with following up on further exploration programs to reveal higher levels of hydrocarbon in the Khor Mor field."

Conclusion

Can the burning of 18.02 billion cubic meters, the emission of 45 million tons of carbon dioxide, and the waste of $2.7 billion annually continue? Meanwhile, this damage is known as black carbon emission and accelerates and worsens the environment and climate of Iraq and the Kurdistan Region.

Despite these damages, according to the latest assessment by the International Energy Agency (IEA)[iii], these climate changes will create significant obstacles for new energy projects in the future, especially solar system projects and utilization of sunlight due to the increase in dust storm days in the future.

Both the Iraqi government and the Kurdistan Regional Government have announced plans to end associated gas flaring in recent years, such as the Iraqi Oil Minister's announcement on April 7, 2024, regarding ending associated gas flaring by 2028, and the Kurdistan Regional Government's notification to companies to end the flaring of gas produced with oil since 2020, but the amount still being burned remains concerning and should not be overlooked.

Finally, if reducing 300 thousand stons of carbon dioxide emissions equals reducing carbon dioxide emissions from 150 thousand automobiles as indicated by Norwegian company DNO, then ending associated gas flaring in Iraq and the Kurdistan Region would be equivalent to converting three times all the automobiles used daily on the roads of Iraq and the Kurdistan Region to electric vehicles with zero carbon dioxide emissions.

References

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