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KURDISTAN GAS PROJECT

A look back and a look ahead

Impact Assessment Report

DANAGAS | Crescent Petroleum | Pearl Petroleum

INTRODUCTION

In 2007, Dana Gas and Crescent Petroleum entered into agreement with the Kurdistan Regional Government (KRG), which provided title and exclusive rights to appraise, develop, produce, market, and sell petroleum, including natural gas domestically and for export, from the Khor Mor and Chemchemal fields in the Kurdistan Region of Iraq (KRI).

In 2009, Pearl Petroleum was formed as a consortium with Dana Gas and Crescent Petroleum as shareholders, with OMV, MOL, and RWE joining the consortium subsequently with a ten per cent share each. The agreement marked the start of the Kurdistan Gas Project's contribution as an enabler in the development of the KRI's gas extraction and production.

Within a record 15 months from the commencement of Project implementation, gas began flowing through newly built pipelines from Khor Mor to power plants in Chemchemal and Erbil. In the ensuing decade, the Project has delivered reliable, affordable energy at scale to the KRI, making a considerable impact on the region's economy, society, and environment.

To commemorate the ten-year anniversary of production operations of the Kurdistan Gas Project, the Pearl Petroleum consortium asked PwC to lead an in-depth study to assess the wider socioeconomic benefits enabled by the Project. PwC studied the impact of the Kurdistan Gas Project in its first decade of operations and projected forward the future impacts based on the anticipated development of the Project over the next decade.

The following briefing outlines PwC's key findings and highlights the considerable returns the Project has and will continue to deliver to the KRI.

THE THREE KEY AREAS OF CONTRIBUTION

PwC assessed the Project's contribution to the KRI in three key areas: economy, society, and the environment, locally and globally, taking both a historic and forward-looking view.

The study reviewed the Project's contribution from 2008 to 2017 and estimated its future contribution to the region, given the extensive investment we are planning in the development of the fields.

How the Kurdistan Gas Project contributes to the KRI

Contribution to the KRI economy

Contribution to the **KRI's Gross Domestic Product (GDP)** through:

- Capital investment
- Operations
- Energy provision

Impact on KRI society

- Creation of **employment**
- Contribution to government **revenues**
- Energy system **cost savings** from diesel savings
- Investment in **community initiatives**

Stewardship of the environment

- **Operational efficiency**
- **Greenhouse gas savings** from diesel savings

LOOKING BACK

A DECADE OF PARTNERSHIP, SERVICE, AND PROGRESS

Capital investment in the gas project infrastructure and day-to-day operations sustain significant economic activity in the KRI. However, the Pearl Petroleum consortium's most significant economic contribution, by far, is through the energy provided to power the KRI's electricity grid.

The electricity generated with gas not only fulfills the basic needs of the KRI's 5.9 million inhabitants, but it also powers activity in all sectors of the economy, including in agriculture, in industry, and in commerce.

By 2017, gas supplies accounted for about 80 per cent of the energy used for electricity generation in the KRI. PwC estimated that, in 2017, this contributed between USD 10.7 billion to USD 18.3 billion to the KRI's GDP by delivering reliable and affordable electricity to the region. This implies that economic growth over the past ten years would have been considerably lower without gas production from the Project.

In the course of those operations, the Project produced 2,200 permanent jobs in 2017 and 20,000 temporary jobs during the construction phase, underscoring the direct economic impact it has had, particularly on local communities.

By supplying natural gas for generating the KRI's electricity, the use of the alternative, more carbon-emitting diesel is avoided. This means that less carbon dioxide emissions are released into the atmosphere as the greenhouse gas footprint of natural gas is considerably lower than what the footprint would be if diesel was used instead.

FIRST TEN YEARS

Total investment		USD 1.3bn
Enabled GDP impact	GDP contribution	USD 10.7bn – USD 18.3bn
Employment impact	Temporary during construction phase	20,000 jobs
	Permanent during operational phase	2,200 jobs (2017)
Savings generated due to fuel substitution	Fuel cost savings to the KRG	USD 19.2bn
	Greenhouse gas emissions savings	29m tCO_2e
Localisation	Local KRI national employment	Over 80%
	Local procurement	USD 0.3bn

Source: PwC analysis (2018)

LOOKING FORWARD

A FUTURE OF CONTINUED INVESTMENT AND PROGRESS

Looking to the next decade, PwC also assessed the Kurdistan Gas Project's socioeconomic impact based on planned USD 4.3 billion in additional expenditure on the Project. The scenario envisions more than tripling production from Khor Mor from the estimated current capacity 400 MMscfd to 1,400 MMscfd from Khor Mor, delivering an additional 750 MMscfd for domestic consumption in the KRI and 250 MMscfd of gas to supply the rest of Iraq.

The expansion would also include production of 285 kbpd of crude oil from Khor Mor and additional condensates and liquefied petroleum gas (LPG). PwC estimated the expanded operations would contribute between USD 28.6 billion and USD 41.6 billion to the KRI's economy by 2027 and result in the creation of 7,500 permanent jobs by supporting economic activity in the KRI.

Nearly 90 per cent of those jobs would be for local KRI nationals within five years and the proportion would progress to an aspired 100 per cent in the years thereafter.

The Project would also save an estimated USD 33.2 billion over the next ten years by replacing diesel with gas and that would result in greenhouse gas emission savings of 77 million tonnes of carbon dioxide equivalent (tCO_2e).

NEXT TEN YEARS

Total investment		USD 4.3bn
Enabled GDP impact	GDP contribution	USD 28.6bn – USD 41.6bn
Employment impact	Temporary during construction phase	84,000 jobs
	Permanent during operational phase	7,500 jobs (2027)
Savings generated due to fuel substitution	Fuel cost savings to the KRG	USD 33.2bn
	Greenhouse gas emissions savings	77m tCO_2e
Localisation	Local KRI national employment	90% within next 5 years 100% eventually
	Local procurement	USD 1.2bn

Source: PwC analysis (2018)

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