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EVALUATION OF THE REALIZATION OF DEVELOPMENT WELLS IN 2021 AND 2022 AS AN EFFORT TO ACHIEVE THE VISION OF OIL AND GAS PRODUCTION OF 1 MILLION BOPD AND 12,000 MMSCFD

Randy Perfibita [*1], Amalia Kusuma Dewi [1], Ageng Warasta [1], Heri Safrizal [1], and Satria Panji Kauripan [1]
[1]SKK Migas
* Email: rperfibita@skkmigas.go.id

Abstract

The year of 2021 and 2022 are quite interesting years for the national oil and gas industry, where the number of development drills being drilled is quite massive and aggressive compared to the drilling for the last 7 years and it is the basis for the number of drillings for the coming years. In 2021, 480 wells have been drilled and 444 onstream wells. Meanwhile in 2022, it has been approved 790 development wells and the potential for an additional 100 wells. This paper discusses the realization of the production achievement from development well, viewed from the perspective of achieving the initial flow rate (Qoi and Qgi). It is hoped that from the perspective, it can represent the evaluation of the effectiveness of the development well as well as the possibility of improvements in the future.

Nationally, in 2021 the total Qoi realization was 90,180 BOPD of the 70,977 BOPD target meanwhile the total Qgi was 991 MMSCFD of the 957 MMSCFD target. If it is seen from the average Qoi achievement of 248 BOPD from the target of 204 BOPD per well, the average Qgi is 7 MMSCFD from the target of 6 MMSCFD / well. Sumatra and Natuna Islands are the areas with the highest number of drillings in 2021. The number of onstream wells are 276 wells with a total Qoi realization of 61,104 BOPD from the target of 39,889 BOPD, a total Qgi of 12 MMSCFD of the target 28 MMSCFD. For 2022, as of July 2022, 419 wells have been drilled and 329 onstream wells have been drilled. Realization of total Qoi of 50.621 BOPD from the target of 56,279 BOPD, total Qgi of 358 MMSCFD from the target of 352 MMSCFD. The future target is that by 2022, 890 wells can be drilled with a target number of onstream wells in 2022 is about 819 wells.

In general, the higher realized wells are due to the discovery of additional upside potential layers, better hydrocarbon saturation than the prognosis, also contribution from new field development projects with very good results. Meanwhile, wells with lower realizations were caused by the realization of a more downdip structural layer, the character of the lens and changes in facies, the realization of lower hydrocarbon saturation and pressure, also operational constraints on drilling and well completion.

Referring to the drilling success in 2021 and 2022, improving optimism as the efforts to increase national oil and gas production and to achieve the national oil and gas production target of 1 million BOPD and 12,000 MMSCFD in 2030. Another important effort to achieve this is the discovery from exploration drilling and implementation of the EOR program in potential fields. Certainly, commitment and good cooperation from all parties are needed to achieve the mission of the national oil and gas industry.

Keyword(s): Development Drilling; Production Performance; National Oil and Gas Industry.

INTRODUCTION

SKK Migas has launched a vision for the national oil and gas industry to reach 1 million barrels of oil per day (BOPD) and 12,000 MMSCFD by 2030. Action that will be the foundation to achieve that target widely known as Indonesia oil & gas Long Term Plan. There are four main strategies to achieve the goal in 2030, namely maintaining high existing production level, transforming resources into production, acceleration of chemical Enhanced Oil Recovery (EOR) and exploration of giant oil discovery as shown in Figure 1. One of the efforts to maintain high existing production level is by doing massive development drilling program.

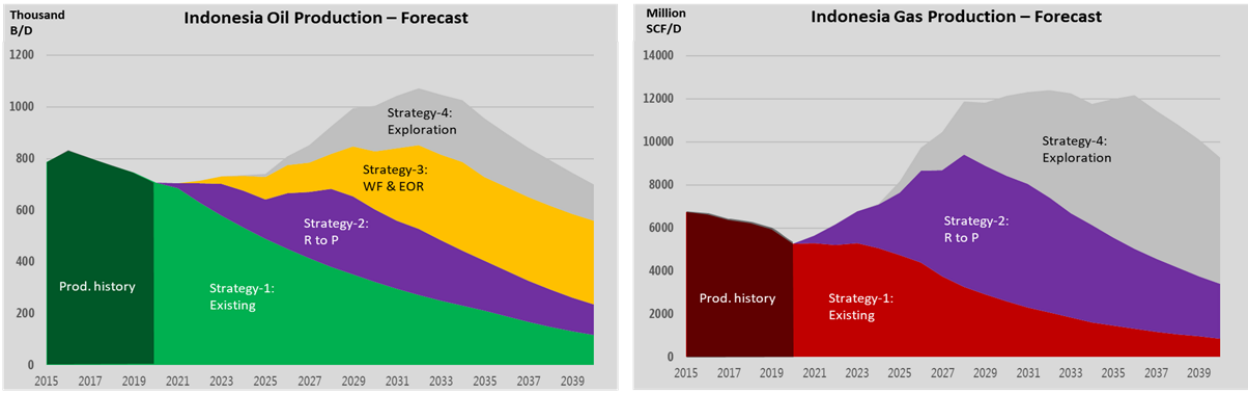

Figure 1. Long Term Plan Profile 2030 (SKK Migas, 2022)

Evaluating the result of development drilling production, especially by looking at the realization of the initial flow rate (Qoi and Qgi), can give the representation of the effectiveness of the development well as well as the possibility of improvements in the future and adjustment of the strategy.

Realization of development drilling initial rate production in 2021 & 2022

Nationally, in 2021 the total Qoi realization was 90,180 BOPD from 363 wells, the total Qgi was 991 MMSCFD from 140 wells and for 2022, as of July 2022, realization of total Qoi was 50.621 BOPD from 305 wells, total Qgi was 358 MMSCFD from 120 wells. Interesting facts from those results as shown in Figure 2 and Figure 3 are in several areas where sum of initial rate could achieve high result but if we compare to the average initial rate it could be the opposite. For example in Northern and Central Sumatera case, both in 2021 and 2022 sum of oil initial rate were really high and could reach more than 50,000 BOPD in 2021 and more than 30,000 BOPD in 2022, but those results come from massive drilling program because the average rate Qoi only around 200 BOPD in 2021 and 150 BOPD in 2022. By mapping these distribution throughout the whole area of Indonesia could give more comprehensive knowledge for the future strategy, such as areas to concentrate for next program and areas need to be re-evaluated due to unsatisfying result.

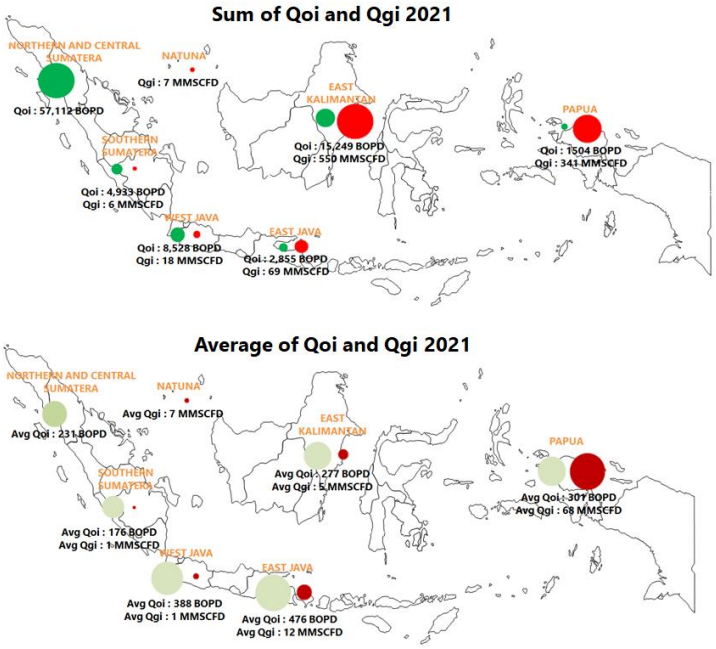

Figure 2. Distribution of Sum and Average Qoi and Qgi Development Drilling 2021 (SKK Migas, 2022)

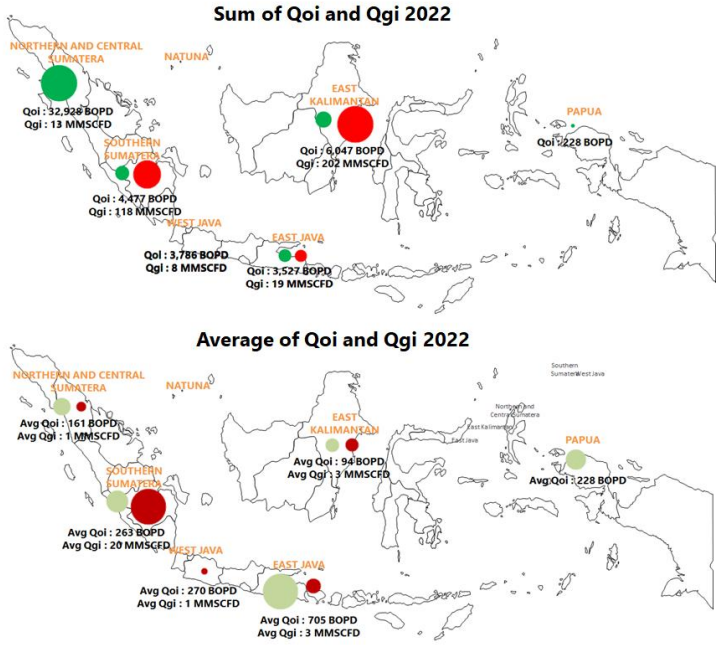

Figure 3. Distribution of Sum and Average Qoi and Qgi Development Drilling 2022 (SKK Migas, 2022)

Lesson Learn and Next Strategy

Referring to the realization of the contribution of development wells from 2021 to 2022, it shows optimism in efforts to achieve national oil and gas production targets. In general, the western region of Indonesia contributes the largest oil, while the eastern region of Indonesia is the largest gas contributor Sumatra Island is the area with the most massive drilling. This is also in line with the total production of IP oil produced as the largest. However, when viewed from the average number of IP generated, in general it is not too big. This is due to the mature field conditions and no exploration discovery with large hydrocarbon potential.

From the subsurface engineering aspect, the majority of the main drilling targets are existing layers, although several wells have also found potential for new reservoir layers. The challenges in evaluating the well target and the realization obtained are a more downdip reservoir target, higher water saturation and also operational problems during completion. The future strategy, as an effort to increase hidrocarbon reserves, it is needed more massive step-out and interfield drilling, as was done at PHR, Pertamina Asset 1 and Pertamina Asset 2 Area. Although it has a high risk of failure, this drilling will open a large potential for future reserves in addition to the efforts made by exploration well.

For the Java Island, the number of drilling wells is not so massive, but on average the IP value per well is the largest. This is dominated by new development projects, so the potential for hydrocarbon reserves is also quite large. In addition, the success of drilling at Pertamina Asset 3 also contributed significantly to production. It is hoped that in the future drilling activities in Java can continue to be improved, especially in the eastern part of Java

For the Borneo Island, the main contributor is in the Mahakam area. The drilling well is also quite massive, although by wells, the potential obtained has decreased in volume. The collaboration between KKKS and the fiscal policy of the government is very helpful for the aggressiveness and economics of the drilling project. For subsurface aspects, evaluation and drilling methods are continuously carried out as well as completion in optimizing the production of the remaining hydrocarbon potential. In addition, exploration activities are still continuing with the hope that new concepts and potential reserves will be found in the Borneo area.

For Papua Island, the gas potential is still very huge. This can be seen from the realization of the production contribution from the drilled development wells. Opportunities needed are the availability of production facilities and the required investment value. In addition, the aspect of gas commerciality in the future is also an important key in the strategy of producing gas in the Papua area. Encouragement from the government and promoting the gas potential of the Papua area to investors are needed to be more active so that drilling and development projects become more massive, aggressive and efficient.

Referring to the momentum of efforts to achieve the national oil and gas industry mission of 1 million BOPD and 12,000 MMSCFD, massive, aggressive and efficient development drilling are one of the important keys to realizing these target. Evaluation and optimization, from the subsurface aspect, drilling and operational aspects, are also an important keys in optimizing Indonesia's hydrocarbon potential. Another important thing is the effort to find exploration with large additional potential reserves, and the application of EOR is also very much needed in achieving the national oil and gas production mission. Commitment from all stakeholders is needed to make this happen.

Conclusion

The years 2021 and 2022 are roadmap in massive, aggressive and efficient development drilling. Referring to the IP realization and the cumulative oil and gas production that obtained, in general it gives a positive impact on the achievement of national oil and gas production. The success of development drilling carried out is generally influenced by the discovery of upside potential, higher hydrocarbon saturation, and contributions from new projects. However, there are several wells that have a more downdip reservoir realization, higher water saturation, changes in facies, operational problem during completion, which are the causes of not achieving the desired target. Continues Improvements need to be made by all team involved. Another important thing is the effort to find exploration with large additional potential reserves, and the application of EOR is also very much needed in achieving the national oil and gas production mission. Commitment from all stakeholders is needed to make this happen

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