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Study on the Impact of Geothermal Production Bonuses in Indonesia : PT Geo Dipa Energi (Persero) Geothermal Working Area

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ABSTRACT

The Indonesian government regulates that geothermal producing areas benefit directly from geothermal exploitation through bonuses on geothermal production. The regulation regarding the bonus of geothermal production is mandated by article 53 of Law Number 21 of 2014 as outlined in Government Regulation Number 28 of 2016 regarding the Amount and Procedure for Granting Geothermal Production Bonuses, which is stipulated more clearly in Regulation of the Minister of Energy and Mineral Resources Number 23 2017 regarding reconciliation procedures, depositing and reporting on geothermal production bonuses. In the regulation, it is explained that for geothermal steam sales, the production bonus that must be paid by the developer is 1 percent of gross income. As for electricity sales, the production bonus is set lower, which is 0.5 percent of gross income. The parameters and weights used as the basis for calculating the production bonus include the area of work, production infrastructure, supporting infrastructure, and realization of production.

As a the only geothermal state-owned company in Indonesia, PT Geo Dipa Energi (Persero) which has four geothermal working areas, contributes considerably to Indonesia state revenue and local government revenue through direct production deposit to the local treasury. Regarding to GeoDipa's Social Economic Report 2017, GeoDipa contributes around Rp 10 billion for Indonesia through Dieng and Patuha production bonuses within the period of 2014 until 2017.

GeoDipa Social Economic Report 2017 applied quantitative approaches, consists of descriptive analysis and regression analysis. The result showed that GeoDipa Geothermal Production Bonuses give a positive impact even though not necessarily direct towards local government revenue.

1. INTRODUCTION

Along with the magnitude of the potential and various strategies for geothermal development, it is expected that geothermal can also contribute to regions that have geothermal exploitation activities. Improving the welfare and economic productivity of the surrounding community.

In 2015 the Government of Indonesia in this matter the Directorate General of New Energy, Renewable and Energy Conservation (EBTKE) of the Ministry of Energy and Mineral Resources held a Socialization of Draft Government Regulation (RPP) on Geothermal Production Bonuses and Geothermal RPP for Utilization Directly. This event was held to equalize views, discussions, and gather inputs from both the Regional Government and related institutions, represented by the Provincial and District / City ESDM Service, especially in relation to the imposition of Geothermal Production and Exploitation Bonuses for direct use.

The socialization of the Draft Government Regulation (RPP) on Geothermal Production and Geothermal RPP Bonuses for Direct Use in 2015 is one of the government's follow-up in implementing Article 53 of Law No. 21 of 2014 concerning geothermal bonus which is one form of utilization of geothermal development which aims to be felt directly by producing regions. Therefore the Minister of Energy and Mineral Resources Regulation Number 23 of 2017 was issued concerning the Procedures for Reconciliation, depositing and reporting of geothermal production bonuses.

2. METHODOLOGY

2.1 Descriptive Analysis

The use of descriptive analysis in this study is in the form of numbers (n) and percentages. This descriptive analysis aims to describe the growth of PT Geo Dipa Energi's PLTP production bonus value, growth in the value of CSR programs, regional revenue growth and GDP growth. Data is obtained from various official sources, then processed and interpreted based on existing trends. (The Social and Economic Impact of Geothermal Development – PT Geo Dipa Energi (Persero), 2018)

2.2 Regression Analysis

Regression analysis used to determine the effect of regional income on GRDP as an economic impact that arises from the contribution of production bonuses to regional income is a panel regression analysis (*pooled data*). Panel Regression Analysis is a regression analysis carried out on data from several of the same individuals observed in a given period of time. The purpose of this analysis is to see the effect of independent variables on the dependent variable so that the estimated model can be estimated or predicted the average value of the dependent variable based on the independent variables. In this research, the type of panel data model used is the Two way model, meaning that besides considering the individual effects (District) this model also considers the effect of time. The estimation method of panel data model used is Random Effect Model (REM). REM method is used to deal with

the possibility of a relationship of interruption variables between time and between individuals so that the model can avoid the phenomenon of heteroscedasticity which is a condition for the formation of a good data panel model

The independent variable used in this analysis is regional income, while the dependent variable used is the value of Gross Regional Domestic Product (PRDB), the regression model obtained is as follows:

$$PDRB = \beta_0 + \beta_1 PD_{ti}$$

GRDP (PRDB) = GRDP district production bonus recipient of PT Geo Dipa Energi PLTP 2015-2017
PD = Regional Revenue of Regency Recipient of the 2015-2017 PT Geo Dipa Energi PLTP production bonus

2.3 Correlation Analysis

Correlation analysis is used to see the closeness of a linear relationship between two variables. Correlation analysis is expressed in a measure of value, namely the correlation coefficient (r_{xy}). The correlation coefficient is between -1 to 1. The sign of the correlation coefficient shows the direction of the relationship between the two variables. A positive sign indicates a directional relationship and a negative sign indicates the existence of the relationship is inversely proportional. The magnitude of the correlation coefficient shows the closeness of the relationship between the two variables, the closer it is to 1 or -1, the relationship between the two variables gets stronger and the closer it gets to 0 the relationship gets weaker.

In this study, the correlation to be measured is the production bonus of PT Geo Dipa Energi PLTP towards regional revenue in the local area

$$r_{xy} = \frac{S_{xy}}{S_x S_y}$$

$$S_{xy} = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{n-1}$$

$$S_x = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \text{ dan } S_y = \sqrt{\frac{\sum (y_i - \bar{y})^2}{n-1}}$$

3. PRODUCTION BONUSES IN INDONESIA

Geothermal Production Bonus or Production Bonus is a financial obligation imposed directly on geothermal permit holders, holders of permits to exploit geothermal resources for gross revenues from the sale of geothermal resources and / or electricity from geothermal power plants.

Geothermal permit holders must provide production bonuses since the first unit produces commercially to the producing local government with the following conditions:

a) Who has produced before Act No. 21 of 2014 concerning Geothermal starts, starting from January 1, 2015 and
b) Those that have not yet produced at the time of Law No. 21 of 2014 concerning Geothermal are effective, starting from the first unit to produce commercially.

Production Bonuses are subject to:

a) 1% (one percent) of gross revenue from the sale of geothermal steam or
b) 0.5% (zero point five percent) of gross revenues from electricity sales

With the existence of this geothermal production bonus, the Producing Regional Government will receive direct benefits in the form of income from the Regional Cash from the operation of the Geothermal Power Plant (PLTP). With this, it is expected that the regional government can together with geothermal entrepreneurs maintain the continuity of geothermal production so that the creation of a mutually beneficial relationship between the Entrepreneur and the producing Regional Government.

4. RESULTS OF THE IMPACT OF PRODUCTION ON ECONOMIC GROWTH IN LOCAL DISTRICT

The production bonus for the local government from geothermal exploitation by the Dieng PLTP located in Central Java began in 2015 until now. While the production bonus from geothermal exploitation by the Patuha PLTP located in West Java began in 2014. The parameters and weights used as the basis for calculating the production bonus for each local government include the area of work, production infrastructure, supporting infrastructure, and the realization of the production of the PT Geo Dipa Energi PLTP. The total bonus of geothermal exploitation production provided by PT Geo Dipa Energi (Persero) to the local regency government has increased every year, starting from 2015 to 2017.

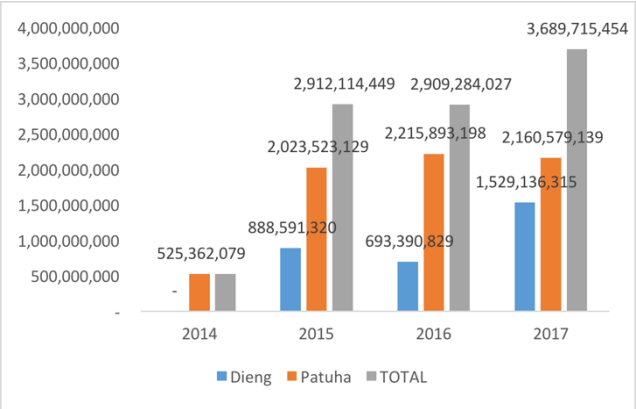

Figure 1: Production Bonus Costs from PLTP Dieng Project and PLTP Patuha Project (The Social and Economic Impact of Geothermal Development, 2018)

The contribution of the production bonus value to regional revenues can be seen by comparing the value of the production bonus that is submitted to the Regional Government towards the non-tax / SDA Balance-Sharing Fund received by the local government in the same period of time. In Table 2 it can be seen that even though the production bonus value submitted to the Regency Government of Bandung is the highest production bonus value compared to other Regional Governments, if seen the value of its contribution to the total non-tax / SDA profit sharing funds received by the Regional Government of Bandung Regency looks small compared to several other regional governments, namely 2% in 2015. While the value of contributions in 2016 and 2017 is 1.89% and 1.4%. This is because the non-tax / SDA profit-sharing value received by the Bandung Regency Government from various natural resource exploitation in the district, the value is very large, considering the abundant and potential natural resources of Bandung Regency. The same goes for Wonosobo Regency, despite the value of the production bonus from the concession.

The Dieng PLTP is quite large after Banjarnegara Regency, but the value of its contribution to non-tax / SDA revenue-sharing funds received by the Regional Government can be said to be small (Table 4-3). The highest contribution value of the production bonus to the highest non-tax / SDA revenue sharing funds is Banjarnegara Regency from 2015 to 2017.

Economic indicators of a region can be seen based on the growth of Gross Regional Domestic Products. As mentioned previously, Gross Regional Domestic Product (GRDP) is the gross added value of all goods and services created or produced in a country's domestic territory arising from various economic activities in a given period without regard to whether the production factor owned by the resident or non-resident. The following is a recapitulation of the value of the Gross Regional Domestic Product (GRDP) on the basis of constant 2010 prices of all districts receiving production bonuses from the Dieng PLTP and Patuha PLTP, which are sourced from the Central Statistics Agency data, 2018.

Local Government (District)	GDP at 2010 Constant Prices (Rupiah)		
	2015	2016	2017
Banjarnegara	12.266.050.000.000	12.929.660.000.000	13.630.000.000.000
Batang	12.327.740.000.000	12.935.490.000.000	13.627.000.000.000
Kendal	24.771.540.000.000	26.159.050.000.000	27.586.000.000.000
Pekalongan	13.234.560.000.000	13.917.700.000.000	14.652.000.000.000
Temanggung	12.486.490.000.000	13.110.800.000.000	13.724.000.000.000
Wonosobo	11.353.870.000.000	11.949.930.000.000	12.293.000.000.000
Bandung	85.620.000.000.000	94.567.000.000.000	103.363.000.000.000

Figure 2: Regency GDP Recipient of Production Bonus in 2015-2017 (Regency / City GRDP, Central Statistics Agency, 2018)

Figure 2 shows that the value of GDP at constant 2010 prices in all districts receiving production bonuses from the operation of the Dieng PLTP and Patuha PLTP tends to increase every year from 2015 to 2017.

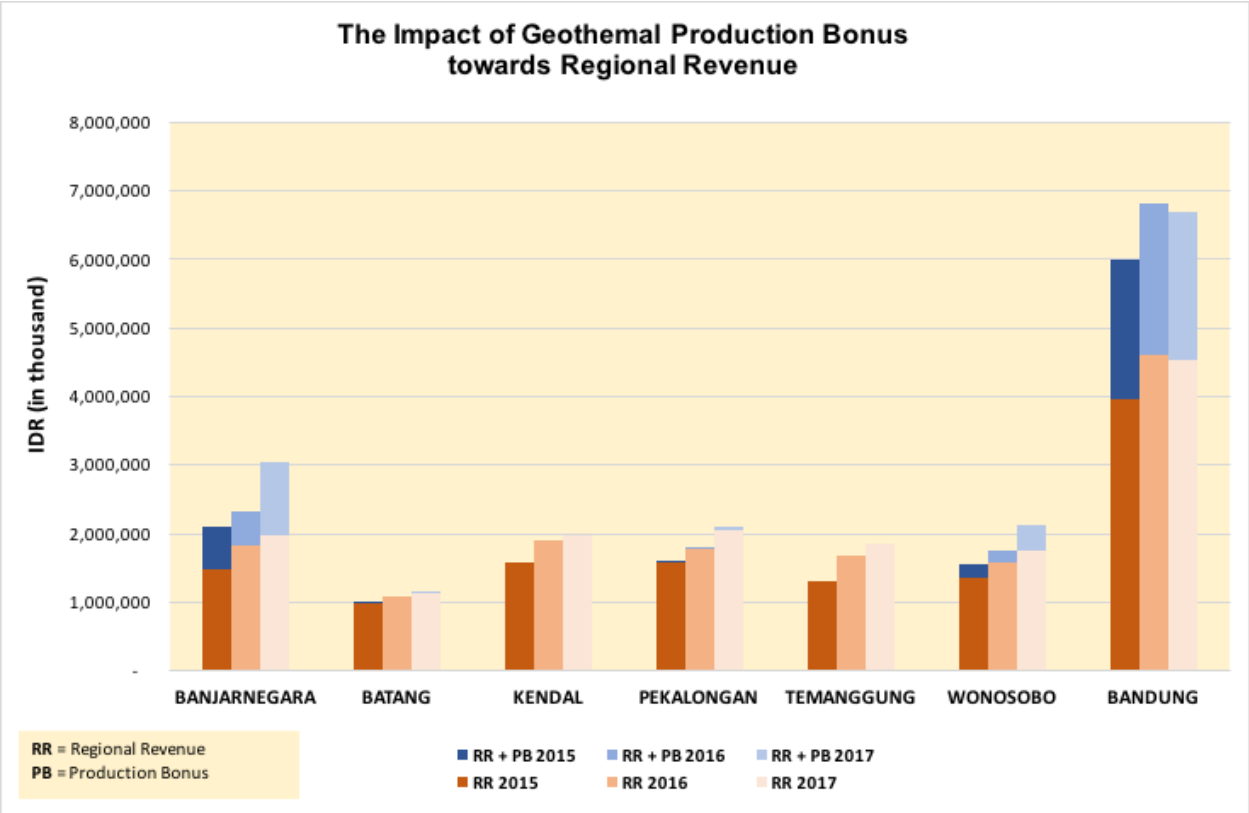

Figure 3: The Impact of GeoDipa's Geothermal Production Bonus towards Regional Revenue.

Production bonus is one of the component parts of regional revenue, which is included in the balance fund as non-tax revenue sharing / SDA. The following is the recapitulation of regional government revenues in 2015-2017.

Based on regional revenue data and GRDP data per district recipient of the Dieng PLTP production bonus and Geodipa PLTP, then the relationship between the two variables was analyzed using panel data regression analysis. In this evaluation study, the model to be used is as follows:

$$PDRB = \beta o + \beta_1 PD_{ti}$$

Based on the results of panel regression analysis, the following data are obtained:

Results of Panel Regression Analysis Table

	Estimate	Std. Error	t-value	Pr(>|t|)
(Intercept)	-11995642631024,900	7135403605157,700	-1,681	0,109
Regional acceptance	19272,743	2978,317	6,471	< 0.0001

Based on the table above, the models obtained from the regression results are as follows:

$$PDRB = -11995642631024{,}9 + 19.273\, PD_{ti}$$

The regression model found is obtained Adjusted R^2 for = 0.688 meaning that 68.8% of the GDP variable can be explained by regional revenue variables and the remaining 31.2% is explained by other variables outside the model. The influence is significant at 0.05 because the test results found the calculated F value of 41.874. Thus it can be concluded that simultaneous regional revenue influences the GRDP in the regency receiving the production bonus of the Dieng PLTP and Patuha PLTP. This means that production bonuses given to the local government as part of regional revenues can have a positive economic impact on the local district.

The results of the correlation analysis between the production bonuses of the Dieng PLTP and Patuha PLTP indicate that the correlation coefficient between the production bonus and regional revenue is 0.010. Values indicate a positive relationship between the production bonus of PT Geo Dipa Energi and the reception of the local regency even though the closeness of the relationship is relatively small.

5. CONCLUSION

PT Geo Dipa Energy's production of geothermal exploitation bonus to the local regency government has a positive relationship to regional revenue and simultaneous regional revenue influences the GRDP in the regency receiving the production bonus of the PLTP Dieng Project and PLTP Patuha Project. Therefore, the production bonus from geothermal exploitation of the PLTP Dieng Project and PLTP Patuha Project play a role in encouraging regional economic growth in the district receiving the production bonus of PT Geo Dipa Energi.

Developments of geothermal resources in Economically Distressed Areas (EDAs) have beneficial impacts by providing jobs to area inhabitants who might be unemployed, and by furnishing tax revenues as well as bonus productions from geothermal projects and small enterprises for improvements in area public facilities and infrastructures, such as site accesses and schools. All these benefits are intended for public well-being that living in the surrounding of geothermal resources. (Zulkarnain, Furqan et al., 2016)

With the amount of data with a period of 3 years in 7 districts, it can show a positive relationship between the production bonus of PT Geo Dipa Energi with local government (district) treasury. From the results of the study, it was concluded that GeoDipa had a positive impact on the local government and improved the quality of life of the communities around the PLTP area.

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