

Identification of key stakeholders for the utilization of geothermal energy in West Java for supporting SDGs number 7

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Abstract. Strategic policies The utilization of geothermal energy and its supply chain must be accompanied by good planning to ensure the distribution and affordability of clean and cheap energy for all people in the present and sustainable future. Stakeholders strongly determine the policies implemented that are more in favor of the interests of certain parties. The public and consumers, both retail and corporate, highly depend on geothermal commodities to meet energy needs and industrial production. Geothermal energy can be used to meet these needs. Identifying stakeholders is the basis for forming a more effective policy strategy later, which can ensure the distribution of geothermal energy in the market and guarantee its supply well. This study uses the prospective analysis method as the basis of the methodology and the MACTOR tool to find the main stakeholders. The results are that the Ministry of Finance, West Java Regional Government, Ministry of Environment, Ministry of Energy and Mineral Resources, and the House of Representatives of the Republic of Indonesia can drive another stakeholders for developed the sustainable utilization of geothermal energy in West Java and then it can support SDGs 7.

1. Introduction

One of a nation's most critical strategic elements is its energy since it influences its sustainability, advancement, security, and durability [1–5]. Energy concerns hold a significant place in the strategic environment, influencing the national, regional, and international dynamics. Indonesia [6–8], being the biggest nation in Southeast Asia, is undoubtedly interested in being able to supply the energy needed for both present and future national development [9–14]. The energy sector's developments, particularly the depletion of non-renewable energy reserves and the need for alternative renewable energy, are a major driving force behind a thorough analysis of the circumstances Indonesia will confront going forward.

The use of geothermal energy is not dependent on fossil energy plants, whose prices tend to be unstable and follow the development of world oil prices [15]. Geothermal plants can also be operated up to 95% of installed capacity with an operating time of more than 30 years

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(EBTKE, 2020). Based on data from the Geological Agency of the Ministry of Energy and Mineral Resources in 2019, Indonesia's geothermal potential is very large, which is around 23.9 GW spread across 351 location points. The largest and most abundant distribution of geothermal potential is found on the island of Sumatra, which has 101 location points and a total resource of 9,679 MW. The next largest distribution of geothermal potential is in Sulawesi, which is spread across 90 location points and has a total resource of 3,068 MW. However, the total potential resources of geothermal power in Java are larger, namely 8,107 MW spread across 73 location points .

The huge potential of new and renewable energy sourced from Geothermal has not been utilized to the fullest; the obstacles faced in the development of this potential are due to regulatory and policy factors, technology and human resources, environmental factors, economic and social values so that it results in a slow development process of utilizing this Geothermal, based on this, to answer the existing potential and problems it is necessary to identify, who are the important stakeholders who can realize the use of geothermal energy in West Java as a supporter of the achievement of sustainable development goal number 7.

2. Methods

This study was carried out at the stakeholder offices between January and September 2024. The main data received and gathered from the FGD were processed using the prospective analysis approach. One method for examining future policy is prospective analysis. A prospective analysis in this study refers to making use of the Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations (MACTOR) instrument. The Prospective Analysis method approach was used to process the acquired primary data. One technique for reviewing a policy in the future is prospective analysis. [30] used the MACTOR (Methode Acteurs, Objective, Reports de Force) tool for prospective analysis in their study. This instance, a cluster typology of possible geothermal West Java was utilized to map the degree of the link between players and elements. When the Mactor technique is used in the decision-making process, it clarifies the position and intensity of variables depending on stakeholders' roles, positions, and attitudes and their influence on a policy to be decided. Filling in the position matrix, also known as the IMAO matrix (Actor-Objective Matrix) and the 2MAO matrix, is how MACTOR operates. The next matrix to be completed is the MID (Direct Influence Matrix) matrix, which describes the influencing variable. The MACTOR will use a computer program to compute the 2MAO matrix after the MID and IMAO matrices have been filled in. The labor system of MACTOR, is described by the following formula:

$$MIDI_{A \rightarrow B} = MIDI_{A \rightarrow B} + \sum_C [(MIDI_{A \rightarrow C}, MIDI_{C \rightarrow B})]$$

To determine the balance of the relationship's strength, the actors' direct and indirect impacts must first be computed. If the direct effects of actor A on the others add up to MA, then:

$$M_A = \sum_B (MIDI_{A,B}) - MIDI_{A,A}$$

Thus, if we define DA, the sum of the direct and indirect effects that A received from other actors is as follows.:

$$D_A = \sum_B (MIDI_{B,A}) - MIDI_{A,A}$$

Additionally, the formula will be used to determine the coefficient of the balance of the relationship's strength.:

$$r_A = \left[\frac{M_{A-MIDL_{A,A}}}{\sum_A (M_A)} \right] \times \left[\frac{M_A}{M_{A+} D_A} \right]$$

In the next step, ACTOR will calculate the 3 MAO matrix, namely the matrix that is the basis and is important in the MACTOR discussion, with the following formulation:

$$3MAO_{A,i} = 2MAO_{A,i} \times r_A$$

The mobilization coefficient, which displays the multiple actors involved in a given circumstance and is explained by the following formula, is one of the features that may be generated using the 3MAO matrix:

$$Mob_A = \sum |3MAO|$$

Approval and disagreement over a goal are then overlaid using the following formula:

$$Ag_A = \sum_a (3MAO_{A,i}(3MAO > 0))$$

$$DisAg_A = \sum_a (3MAO_{A,i}(3MAO < 0))$$

Two further features that can be processed from the 3MAO matrix are the convergence matrix (3CAA), which shows the level of agreement among the players on a particular topic, and the divergence matrix (3DAA), which shows the opposite or disagreement. The convergence matrix (approval) is generated using the following formula:

$$3CAA = \frac{1}{2} \sum \left([3MAO_{A,i}] + [3MAO_{B,i}] \right) (3MAO_{A,i} \times 3MAO_{B,i} > 0)$$

While the divergence (disagreement) matrix is written with the formula:

$$3DAA = \frac{1}{2} \sum \left([3MAO_{A,i}] + [3MAO_{B,i}] \right) (3MAO_{A,i} \times 3MAO_{B,i} < 0)$$

Additionally, the final actor from MACTOR—the ambivalence coefficient for each actor—is determined by the following formula based on the convergence and divergence between these actors:

$$3EQ_i = 1 - \left[\frac{(\sum_k ||3CAA_{i,k} - 3DAA_{i,k} ||)}{(\sum_k ||3CAA_{i,k} + 3DAA_{i,k} ||)} \right]$$

In addition to creating stakeholder FGD results that are directly relevant to the geothermal West Java, this study maps the opinions of key stakeholders and employs a prospective analysis approach.

The Seelig method developed by was used to conduct the FGD and was developed by. The variables for the geothermal were analyzed by addressing seven criteria, seven actions, and two policy scenarios. The structure, dynamics, and network of reciprocal interactions among the most significant stakeholders in the province of West Java are examined in this study using a prospective structural paradigm approach. To identify important and decisive stakeholders in the area's growth, data was gathered through Focus Group Discussions (FGD) and workshops to fill out the software used for data analysis.

The discussion will be carried out using the world café method to encourage participant interaction, knowledge sharing, and experience transfer. The FGD participants numbered 23 people, representing stakeholders. People come from various stakeholders.

3. Results and Discussion

The accuracy of the informants in identifying motivated stakeholders who are thought to have an impact on sustainable geothermal governance in West Java in support of SDG no. 7 is a major determinant of the study's findings. In order to do this, specialists briefed participants on the idea of sustainable development and the significance of geothermal energy in strategic positions and values at the beginning of the FGD. After that, a list of stakeholders was made based on the participants' understanding, knowledge, and experience. Stakeholders who were thought to have an impact on sustainable governance in West Java in support of SDGs No. 7 and No. 4 were identified by the discussion findings (Table 2). Tables 1 and 2 display stakeholder and aim factors. Actors are stakeholders [12, 30, 31]. Furthermore, the results of a future study using MACTOR software show how the actors in the visualisation are interconnected, as seen in Table 3.

Table 1. Stakeholder

No	Long label	Short label
1	PGE Geothermal Energy Company	PT X
2	Geothermal Energy Company Star Energy	PT Y
3	Vendor 1	V01
4	Vendor 2	V02
5	Vendor 3	V03
6	Vendor 4	V04
7	Vendor 5	V05
8	Ministry of Energy and Mineral Resources	ESDM
9	Ministry of Environment	KLHK
10	Ministry of Finance	Kemenkeu
11	West Java Regional Government	Pemda
12	House of Representatives of the Republic of Indonesia	DPR
13	West Java DPRD	DPRD
14	Bappeda Jabar	Bappeda
15	Surrounding Community	Masyarakat
16	Academy	Akademisi
17	Riset & Development	R&D
18	User	Konsumen
19	PLN	PLN
20	National Energy Council	DEN
21	Indonesian Geothermal Association	APBI

Table 2. Goal variables

No	Long label	Short label	Stake
1	Subsidy policy	Subsidies	Consumer
2	Policy on providing additional incentives	Incentive	Produsen

The Ministry of Energy and Mineral Resources (scoring 398), the Ministry of Environment (score 398), the Ministry of Finance (score 398), and the West Java Regional Government (score 398) are the stakeholders with the biggest sway. On the other hand, users with a score of 0 are stakeholders who are typically very dependent. The Indonesian Ministry of Energy and Mineral Resources (score 398), the Ministry of Environment (score 398), the Ministry of Finance (score 398), and the West Java Regional Government (score 398) all have a significant and determining impact on the outcome of each scenario in the sustainable geothermal West Java, which helps to achieve SDG 7. Users, on the other hand, are the stakeholders with the least ability to influence the sustainable geothermal West Java scenario and support the success of SDG No. 7.

Table 3. Interdependence matrix between actors

Actor	PT X	PT Y	V01	V02	V03	V04	V05
PT X	5	8	6	6	6	6	6
PT Y	5	5	5	5	5	5	5
V01	25	27	23	23	23	23	23
V02	25	28	23	23	23	23	23
V03	25	28	23	23	23	23	23
V04	25	28	23	23	23	23	23
V05	25	28	23	23	23	23	23
ESDM	31	33	29	31	31	31	31
KLHK	31	33	29	31	31	31	31
Kemenkeu	31	33	29	31	31	31	31
Pemda	31	33	29	31	31	31	31
DPR	28	30	28	28	28	28	28
DPRD	0	0	0	0	0	0	0
Bappeda	0	0	0	0	0	0	0
Masyarakat	0	0	0	0	0	0	0
Akademisi	0	0	0	0	0	0	0
R&D	0	0	0	0	0	0	0
Konsumen	0	0	0	0	0	0	0
PLN	22	25	21	21	21	21	21
DEN	22	25	21	21	21	21	21
APBI	22	25	21	21	21	21	21
Di	348	384	310	318	318	318	318

Table 3. Interdependence matrix between actors (continue)

Actor	ESDM	KLHK	Kemenkeu	Pemda	DPR
PT X	0	0	0	0	0
PT Y	0	0	0	0	0
V01	0	0	0	0	0
V02	0	0	0	0	0
V03	0	0	0	0	0
V04	0	0	0	0	0
V05	0	0	0	0	0
ESDM	8	8	8	8	8
KLHK	8	8	8	8	8
Kemenkeu	8	8	8	8	8
Pemda	8	8	8	8	8
DPR	8	8	8	8	8
DPRD	0	0	0	0	0
Bappeda	0	0	0	0	0
Masyarakat	0	0	0	0	0
Akademisi	0	0	0	0	0
R&D	0	0	0	0	0
Konsumen	0	0	0	0	0
PLN	0	0	0	0	0
DEN	0	0	0	0	0
APBI	0	0	0	0	0
Di	32	32	32	32	32

Table 3. Interdependence matrix between actors (continue)

Actor	DPRD	Bappeda	Masyarakat	Akademisi	R&D
PT X	5	5	11	9	11
PT Y	5	5	8	7	8
V01	5	5	11	9	11
V02	5	5	11	9	11
V03	5	5	11	9	11
V04	5	5	11	9	11
V05	5	5	11	9	11
ESDM	5	5	9	9	9
KLHK	5	5	9	9	9
Kemenkeu	5	5	9	9	9
Pemda	5	5	9	9	9
DPR	4	4	8	8	8
DPRD	0	0	0	0	0
Bappeda	0	0	0	0	0
Masyarakat	0	0	0	0	0
Akademisi	0	0	0	0	0
R&D	0	0	0	0	0
Konsumen	0	0	0	0	0
PLN	5	5	11	9	11
DEN	5	5	11	9	11
APBI	5	5	11	9	11
Di	74	74	151	132	151

Table 3. Interdependence matrix between actors (continue)

Actor	Konsumen	PLN	DEN	APBI	li
PT X	12	5	5	5	106
PT Y	9	5	5	5	87
V01	32	19	19	19	274
V02	33	19	19	19	276
V03	33	19	19	19	276
V04	33	19	19	19	276
V05	33	19	19	19	276
ESDM	25	29	29	29	398
KLHK	25	29	29	29	398
Kemenkeu	25	29	29	29	398
Pemda	25	29	29	29	398
DPR	22	26	26	26	362
DPRD	0	0	0	0	0
Bappeda	0	0	0	0	0
Masyarakat	0	0	0	0	0
Akademisi	0	0	0	0	0
R&D	0	0	0	0	0
Konsumen	0	0	0	0	0
PLN	29	19	19	19	260
DEN	29	19	19	19	260
APBI	29	19	19	19	260
Di	394	285	285	285	4305

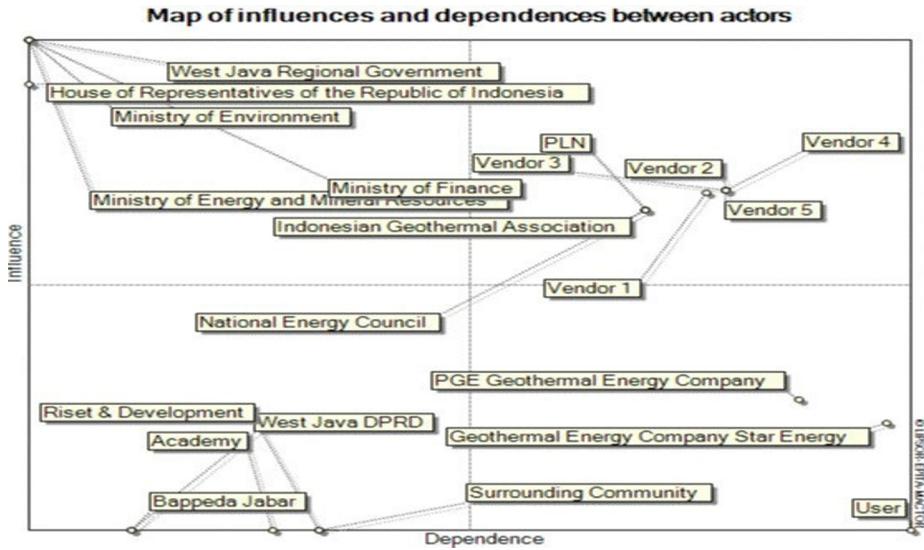


Fig 1. Map of influences and dependencies between actors.

MACTOR fills up the position matrix, also referred to as the IMAO matrix (ActorObjective Matrix) and the 2MAO matrix. The next matrix to be completed is the Direct Influence Matrix (MID), which describes the influencing variable. Once the MID and IMAO matrices have been completed, the MACTOR will use a computer program to calculate the 2MAO matrix.

The Ministry of Energy and Mineral Resources (score 398), the Ministry of Environment (score 398), the Ministry of Finance (score 398), and the West Java Regional Government (score 398) all have a significant and decisive impact on the outcome of each scenario in the sustainable geothermal and support the achievement of SDGs 7. The Indonesian House of Representatives is located in quadrant I (upper left) of Fig 1. All stakeholders in this quadrant have a large influence and low dependence on the sustainable geothermal West Java governance scenario that supports SDG no. 7. PGE Geothermal Energy Company, Geothermal Energy Company Star Energy, and User, on the other hand, are highly dependent on and have no influence over the sustainable geothermal West Java governance scenario that supports SDG no. 7 in quadrant 3 (bottom right). Relay stakeholders include PLN, the National Energy Council, the Indonesian Geothermal Association, and Vendors 1, 2, 3, 4, and 5 in quadrant two. Through the effects of Quadrant 1 stakeholders' activities on Quadrant 2 stakeholders, these relay stakeholders significantly impact Quadrant 3 while still relying on driven stakeholders in Quadrant 1. As independent stakeholders with no effect functions, Riset & Development, West Java DPRD, Bappeda, and Academy are in quadrant four.

With a score of 21.6, the Indonesian House of Representatives (DPR) is the stakeholder with the highest mobilization scores, according to Table 4. This implies that these stakeholders will actively participate in geothermal dynamics in terms of their goals. Which goals are anticipated to be the primary concerns that elicit stakeholder responses are indicated by the degree of mobilization (bottom row). With a score of 173.1, the Policy of giving more incentives (incentive) objective in this instance is one that the actors deem significant [12]. The position of 3MAO can also be seen as a bar chart in Fig 2.

Table 4. 3 MAO

3MAO	Subsidies	Incentive	Mobilization
PT X	8.5	9	17.5
PT Y	8.4	8.6	17.1
V01	8.3	10.1	18.4
V02	8.3	10.1	18.4
V03	8.3	10.1	18.4
V04	8.3	10.1	18.4
V05	8.3	10.1	18.4
ESDM	2.8	2.8	5.5
KLHK	8.3	8.3	16.6
Kemenkeu	0	0	0
Pemda	8.3	8.3	16.6
DPR	13.3	8.3	21.6
DPRD	8.3	8.3	16.6
Bappeda	8.3	8.3	16.6
Masyarakat	8.3	8.3	16.6
Akademisi	8.3	8.3	16.6
R&D	8.3	8.3	16.6
Konsumen	8.3	8.3	16.6
PLN	4.8	8.3	13.1
DEN	8.3	8.3	16.6
APBI	8.3	10.9	19.2
Number of agreements	162.2	173.1	
Number of disagreements	0	0	
Degree of mobilisation	162.2	173.1	

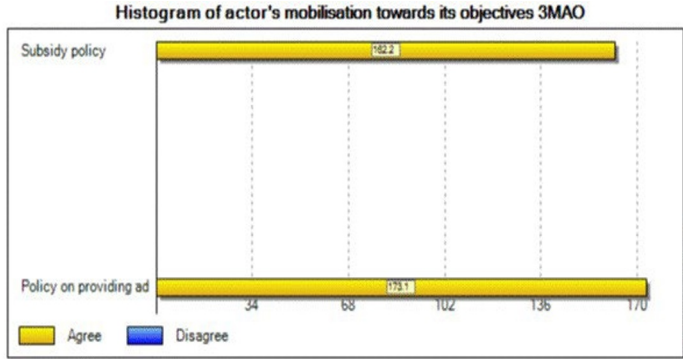


Fig 2. Histogram 3MAO

Table 5 below displays the level of stakeholder convergence. The Ministry of Finance's (Kemenkeu) convergence is the highest level. The state of this convergence table demonstrates the strength of the stakeholder convergence situation [12]. This convergence trend is shown in Fig 4 and 5. The following is a graphical depiction of Table 5. The position of this convergence can also be seen in map form in Fig 3.

Table 5. Degree of convergence between stakeholders

3CAA	PT X	PT Y	V01	V02	V03	V04
PT X	0	0.7	1.3	1.3	1.3	1.3
PT Y	0.7	0	1.1	1.1	1.1	1.1
V01	1.3	1.1	0	1.8	1.8	1.8
V02	1.3	1.1	1.8	0	1.8	1.8
V03	1.3	1.1	1.8	1.8	0	1.8
V04	1.3	1.1	1.8	1.8	1.8	0
V05	1.3	1.1	1.8	1.8	1.8	1.8
ESDM	0	0	0	0	0	0
KLHK	0	0	0	0	0	0
Kemenkeu	0	0	0	0	0	0
Pemda	0	0	0	0	0	0
DPR	2.6	2.6	0	0	0	0
DPRD	0	0	0	0	0	0
Bappeda	0	0	0	0	0	0
Masyarakat	0	0	0	0	0	0
Akademisi	0	0	0	0	0	0
R&D	0	0	0	0	0	0
Konsumen	0	0	0	0	0	0
PLN	0	0	0	0	0	0
DEN	0	0	0	0	0	0

APBI	1.7	1.5	2.2	2.2	2.2	2.2
Number of convergences	11.3	10.1	11.8	11.8	11.8	11.8
Degree of convergence (%)	0					

Table 5. Degree of convergence between stakeholders (continue)

3CAA	V05	ESDM	KLHK	Kemenkeu	Pemda
PT X	1.3	0	0	0	0
PT Y	1.1	0	0	0	0
V01	1.8	0	0	0	0
V02	1.8	0	0	0	0
V03	1.8	0	0	0	0
V04	1.8	0	0	0	0
V05	0	0	0	0	0
ESDM	0	0	0	13.8	0
KLHK	0	0	0	0	0
Kemenkeu	0	13.8	0	0	0
Pemda	0	0	0	0	0
DPR	0	0	0	0	0
DPRD	0	0	0	0	0
Bappeda	0	0	0	0	0
Masyarakat	0	0	0	0	0
Akademisi	0	0	0	0	0
R&D	0	0	0	0	0
Konsumen	0	0	0	0	0
PLN	0	4.5	0	5.9	0
DEN	0	0	0	0	0
APBI	2.2	0	0	0	0
Number of convergences	11.8	18.4	0	19.7	0
Degree of convergence (%)					

Table 5. Degree of convergence between stakeholders (continue)

3CAA	DPR	DPRD	Bappeda	Masyarakat
PT X	2.6	0	0	0
PT Y	2.6	0	0	0
V01	0	0	0	0
V02	0	0	0	0
V03	0	0	0	0
V04	0	0	0	0
V05	0	0	0	0
ESDM	0	0	0	0
KLHK	0	0	0	0
Kemenkeu	0	0	0	0
Pemda	0	0	0	0
DPR	0	0	0	0
DPRD	0	0	0	0
Bappeda	0	0	0	0
Masyarakat	0	0	0	0
Akademisi	0	0	0	0
R&D	0	0	0	0
Konsumen	0	0	0	0
PLN	0	0	0	0
DEN	0	0	0	0
APBI	0	0	0	0
Number of convergences	5.1	0	0	0
Degree of convergence (%)				

Table 5. Degree of convergence between stakeholders (continue)

3CAA	Akademisi	R&D	Konsumen	PLN	DEN	APBI
PT X	0	0	0	0	0	1.7
PT Y	0	0	0	0	0	1.5
V01	0	0	0	0	0	2.2
V02	0	0	0	0	0	2.2
V03	0	0	0	0	0	2.2
V04	0	0	0	0	0	2.2
V05	0	0	0	0	0	2.2
ESDM	0	0	0	4.5	0	0
KLHK	0	0	0	0	0	0
Kemenkeu	0	0	0	5.9	0	0
Pemda	0	0	0	0	0	0
DPR	0	0	0	0	0	0
DPRD	0	0	0	0	0	0
Bappeda	0	0	0	0	0	0
Masyarakat	0	0	0	0	0	0
Akademisi	0	0	0	0	0	0
R&D	0	0	0	0	0	0
Konsumen	0	0	0	0	0	0
PLN	0	0	0	0	0	0
DEN	0	0	0	0	0	0
APBI	0	0	0	0	0	0
Number of convergences	0	0	0	10.4	0	14.3
Degree of convergence (%)						

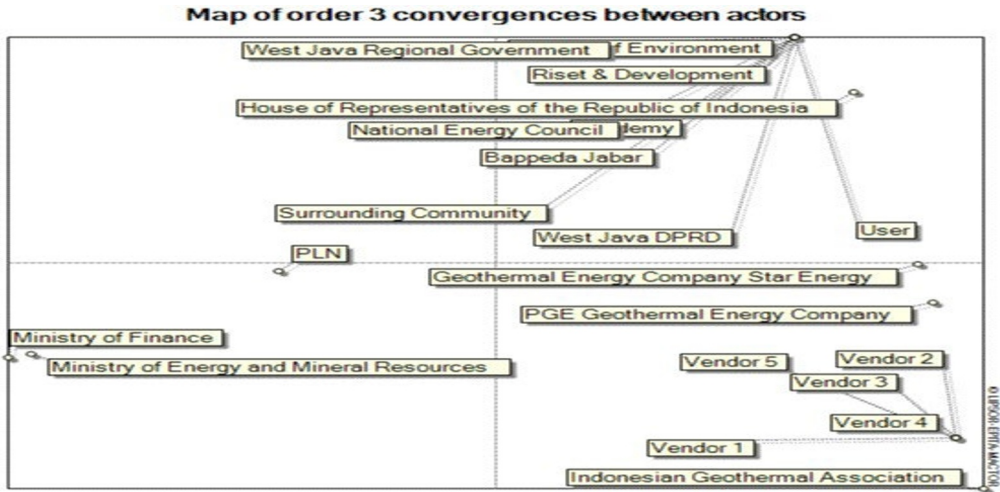


Fig 3. Map of convergence between stakeholders

Table 6. Degree of divergence between stakeholders

3DAA	PT X	PT Y	V01	V02	V03	V04
PT X	0	0	0	0	0	0
PT Y	0	0	0	0	0	0
V01	0	0	0	0	0	0
V02	0	0	0	0	0	0
V03	0	0	0	0	0	0
V04	0	0	0	0	0	0
V05	0	0	0	0	0	0
ESDM	6	5.8	3.7	3.7	3.7	3.7
KLHK	0	0	0	0	0	0
Kemenkeu	8.7	8.5	5.1	5	5	5
Pemda	0	0	0	0	0	0
DPR	0	0	0	0	0	0
DPRD	0	0	0	0	0	0
Bappeda	0	0	0	0	0	0
Masyarakat	0	0	0	0	0	0
Akademisi	0	0	0	0	0	0
R&D	0	0	0	0	0	0
Konsumen	0	0	0	0	0	0
PLN	1.9	1.8	0	0	0	0
DEN	0	0	0	0	0	0
APBI	0	0	0	0	0	0
Number of divergences	16.6	16.1	8.7	8.7	8.7	8.7
Degree of divergence (%)	0					

Table 6. Degree of divergence between stakeholders (continue)

3DAA	V05	ESDM	KLHK	Kemenkeu	Pemda
PT X	0	6	0	8.7	0
PT Y	0	5.8	0	8.5	0
V01	0	3.7	0	5.1	0
V02	0	3.7	0	5	0
V03	0	3.7	0	5	0
V04	0	3.7	0	5	0
V05	0	3.7	0	5	0
ESDM	3.7	0	0	0	0
KLHK	0	0	0	0	0
Kemenkeu	5	0	0	0	0
Pemda	0	0	0	0	0
DPR	0	5.3	0	6.6	0
DPRD	0	0	0	0	0
Bappeda	0	0	0	0	0
Masyarakat	0	0	0	0	0
Akademisi	0	0	0	0	0
R&D	0	0	0	0	0
Konsumen	0	0	0	0	0
PLN	0	0	0	0	0
DEN	0	0	0	0	0
APBI	0	4.1	0	5.5	0
Number of divergences	8.7	39.4	0	54.6	0
Degree of divergence (%)					

Table 6. Degree of divergence between stakeholders (continue)

3DAA	DPR	DPRD	Bappeda	Masyarakat
PT X	0	0	0	0
PT Y	0	0	0	0
V01	0	0	0	0
V02	0	0	0	0
V03	0	0	0	0
V04	0	0	0	0
V05	0	0	0	0
ESDM	5.3	0	0	0
KLHK	0	0	0	0
Kemenkeu	6.6	0	0	0
Pemda	0	0	0	0
DPR	0	0	0	0
DPRD	0	0	0	0
Bappeda	0	0	0	0
Masyarakat	0	0	0	0
Akademisi	0	0	0	0
R&D	0	0	0	0
Konsumen	0	0	0	0
PLN	4.3	0	0	0
DEN	0	0	0	0
APBI	0	0	0	0
Number of divergences	16.2	0	0	0
Degree of divergence (%)				

Table 6. Degree of divergence between stakeholders (continue)

3DAA	Akademisi	R&D	Konsumen	PLN	DEN	APBI
PT X	0	0	0	1.9	0	0
PT Y	0	0	0	1.8	0	0
V01	0	0	0	0	0	0
V02	0	0	0	0	0	0
V03	0	0	0	0	0	0
V04	0	0	0	0	0	0
V05	0	0	0	0	0	0
ESDM	0	0	0	0	0	4.1
KLHK	0	0	0	0	0	0
Kemenkeu	0	0	0	0	0	5.5
Pemda	0	0	0	0	0	0
DPR	0	0	0	4.3	0	0
DPRD	0	0	0	0	0	0
Bappeda	0	0	0	0	0	0
Masyarakat	0	0	0	0	0	0
Akademisi	0	0	0	0	0	0
R&D	0	0	0	0	0	0
Konsumen	0	0	0	0	0	0
PLN	0	0	0	0	0	0
DEN	0	0	0	0	0	0
APBI	0	0	0	0	0	0
Number of divergences	0	0	0	7.9	0	9.6
Degree of divergence (%)						

Table 6 displays the divergence of various stakeholders. The Ministry of Finance (Kemenkeu) has a score of 54.6, which indicates a significant degree of divergence. Since most government stakeholders have low divergence scores, there is a propensity for conflict between these institutions to be minimal. In contrast, the Ministry of Finance has highly different interests from other stakeholders.

Table 6 displays the extent of the actors' differences or divergence. Compared to other players, exporters have the greatest non-conformance rate in the above matrix. Fig. 4 makes this explanation very evident.

Fig. 4 displays the "distance" between players, which shows how distant or close these individuals can cooperate with one another. It also shows the direction and magnitude of divergence between actors. These circumstances demonstrate the distances and groups of stakeholders who share similar interests.

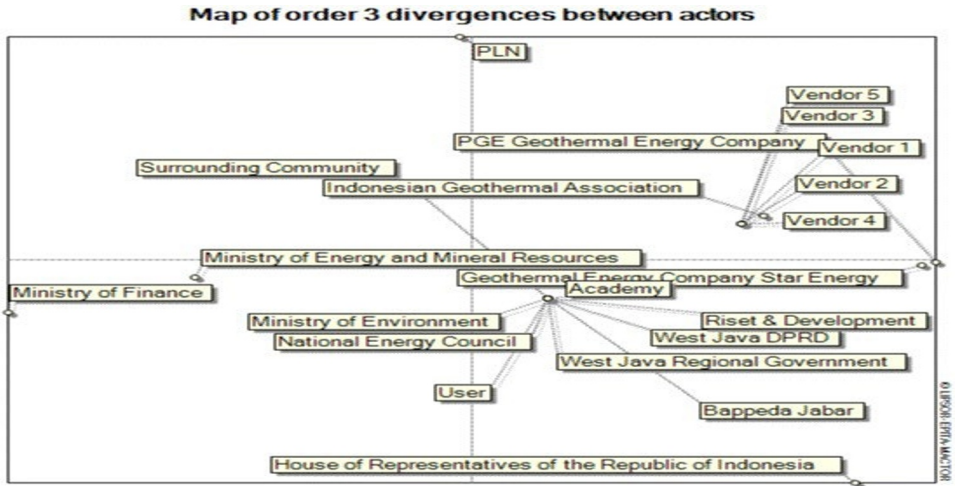


Fig 4. Map of Divergence between stakeholders

4. Conclusions

The primary stakeholders in sustainable geothermal governance that effectively promote sustainable development no. Seven in the policy manifestation of offering incentives were identified by this study, along with the order of priority scales. The Indonesian House of Representatives, the Ministry of Finance, the West Java Regional Government, the Ministry of Environment, the Ministry of Energy and Mineral Resources, and the Ministry of Finance all have a significant and powerful impact on the outcome of every West Java geothermal scenario that promotes the achievement of SDG No. 7. All parties involved in policymaking can use the study's findings as a solid basis to concentrate their policies on actors in the determinant and relay quadrants, which have a significant impact on other variables. The Ministry of Finance, the West Java Regional Government, the Ministry of Environment, the Ministry of Energy and Mineral Resources, and the Indonesian House of Representatives are the primary stakeholders who can impact this success. They have a significant and decisive impact on the success of every sustainable geothermal scenario and help achieve SDG No. 7. The National Energy Council, the Indonesian Geothermal Association, and vendors are next in line. By understanding the results of this study, all key stakeholders can be involved in decision-making through a good governance system supported by incentive policies. The results of this study are based on an institutional perspective; it is hoped that the results can be used as a basis for the management of structures, resources, authority, and relationships between actors that have a very strong and decisive influence on the success of each scenario in West Java for sustainable geothermal and support the success of SDGs no.7.

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