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► **To cite this version:**

Raphael J Heffron, Monika Merdekawati, Beni Suryadi, Zulfikar Yurnaidi. Defining a ‘Just Energy Investment’ for the ASEAN Just Transition. *Environmental and Sustainability Indicators*, 2024, 22, pp.100367. 10.1016/j.indic.2024.100367 . hal-04566460

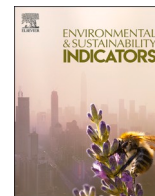
**HAL Id: hal-04566460**

**<https://hal.science/hal-04566460>**

Submitted on 2 May 2024

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## Defining a ‘Just Energy Investment’ for the ASEAN Just Transition

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### ARTICLE INFO

#### Keywords:

Energy investment  
Just energy investments  
Energy justice  
Just transition  
ASEAN energy sector  
JUST framework  
Just energy investment index

### ABSTRACT

Governments across the world have been updating their energy and climate policies since the 2015 Paris Agreement. One common feature is the advent of long-term plans for a net-zero economy for 2050 and also in some cases to 2060. To meet these long-term net-zero targets therefore, significant investment in new and clean energy infrastructure is needed. This research focuses on how to ensure that this required energy investment happens in a ‘just’ way, i.e., it contributes to fairness, equity, equality and inclusiveness. Recently, countries such as the United States, South Africa and Colombia have incorporated justice principles into their energy and climate policies. This research builds on this and is the first to assess justice in consideration of these time horizons along with its focus on the 10 South-East Asian nations, known as ASEAN countries. The data analysed here provides insight into how energy investments are developing in these countries, whether justice policies are aligned and therefore how to avoid energy policy failure. Further, as well as the conceptual advances, this research provides a model for a Just Energy Investment (JEI) Index based on the five energy justice principles. The analysis here focuses on countries of the Global South where there exists limited research that looks at the performance over time of the combined issue of energy investments and justice; this demonstrates this research as a significant contribution to the literature. This research marks a first step in delivering justice in new energy development as these economies build towards their 2050 and 2060 energy and climate targets.

### 1. Introduction – the call for just energy investments

Justice as a concern in the energy and climate transition is growing fast. At the recent [United Nations COP28](#), the just transition to a low-carbon economy is at the forefront of the event. A cursory glance at the pre-COP28 position statements of multiple stakeholders reveals that they all include the justice issue as part of their policy position. Indeed, society is seeing more and more policy initiatives where a central aim is to improve just outcomes for society. This research follows this international policy agenda and aims to contribute to justice research with a focus on energy infrastructure investment research.

There are a variety of different reports that express different estimated figures, but they are all very high, and one report states that in excess of \$120 trillion (estimated for 2015–2050) ([IRENA, 2016](#)) is needed in new energy investment to meet society’s energy and climate transition goals globally. This should be expected as energy demand is increasing, for example, because of population rises, more technology utilises electricity and old infrastructure needs replacing. All this new energy infrastructure needs to deliver more just outcomes whereby in

essence ‘no one is left behind’ in this energy and climate transition, i.e., to secure a just transition to a low-carbon economy.

This article focuses on the ASEAN region which is an important one as it is set to continue to grow in terms their economies and populations and therefore energy demand is set to rise. According to the 6th ASEAN Energy Outlook (AEO6), the region could more than double its primary energy supply from 2017 to 2040, and result in 768.2 million people and 20 trillion USD (at constant 2011 prices) by 2040 ([ASEAN Centre for Energy, 2020](#)). In addition, the region needs to move away from a reliance on coal and shift to clean energy ([Chan, H. et al. 2022](#)). ASEAN is aiming to transform and has set aspirational interim targets of 23% renewable energy share in primary energy supply and to have 32% of installed power capacity in form of renewable energy by 2025 ([ASEAN Centre for Energy, 2020](#)).

ASEAN consists of 10 ASEAN countries, which are: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. This paper aims to explore what just energy investment is happening in these countries and what is the prognosis for the future. A definition of a ‘just energy investment’ (JEI)

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<https://doi.org/10.1016/j.indic.2024.100367>

Received 5 December 2023; Received in revised form 18 February 2024; Accepted 19 February 2024

Available online 20 February 2024

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is advanced here, and is: *where a just energy outcome is secured for society which aligns to energy and climate societal goals over the medium to long-term, and financing is in accordance with a set of just energy principles which will deliver a just transition to a low-carbon economy.*

Our research results from our data analysis across 10 ASEAN countries demonstrates the value of this definition which has clarity and impact in terms of economies aiming to have improved just outcomes from their energy sectors. There is limited research in this area of just energy investments. There is some that reflects on issues of the behaviour of energy companies and whether that is just (Sokolowski and Taylor, 2023; Heffron, 2021). This research assesses data across the five principles of justice and in the context of geographical scope and energy and climate timelines provided by Governments' international commitments. Overall, our data model provides a just energy investment (JEI) index for the ASEAN countries and will be replicable for other regions across the world.

The paper begins by a brief literature review on the just transition, what a just energy investment is and the rising importance of justice in the energy sector. Section 3 explores the justice theory and the method. Section 4 and 5 provide the key analysis and conclusions for ASEAN countries based on our just energy investment (JEI) index.

## 2. Literature review & a definition for a just energy investment (JEI)

### 2.1. Why is a definition for a just energy investment (JEI) needed?

Ensuring 'justice' is at the heart of decision-making in the energy and climate transition is on the rise. Indeed, energy justice research has increased significantly over the last ten years, for example, see below in Table 1. It is evident that both research on energy justice itself and also on the five specific energy justice principles has developed during this time, but to-date it has not addressed the issue of justice and energy investments.

There have also been developments in policymaking where by several countries have started to introduce these energy justice principles into the policymaking process. This is the case in the US, Colombia and South Africa as they plan the transformation of their economies with the energy and climate transition in mind (this is discussed in detail more in Section 3). Significantly they use specific research literature to identify what the energy justice principles are – see Table 2. And in essence they are stating to investors that they must invoke these principles in their new energy project design (as in the United States specifically) and in their energy strategies more broadly.

There is an implicit recognition in these countries that they should be further along the pathway to a just energy transition. Therefore, there is a realisation that the current system is mired by some policy failures. This highlights and aligns with recent theory in the area which has been focusing on resolving energy policy failures (Sokolowski and Heffron, 2022). The continued energy infrastructure development policies of countries worldwide need to move to developing clean energy projects. The definition of energy policy failure ("energy policy failure is any energy policy which does not meet local, national, and international energy and climate goals across the activities of the energy life-cycle and where just outcomes are not delivered" (Sokolowski and Heffron, 2022)) highlights that it results in unjust outcomes, and that is what a just energy investment can solve. It provides a solution to the solving energy policy failures.

### 2.2. Why focus on energy investments in ASEAN?

ASEAN countries are an important focus for energy investment research for a number of reasons. For example, it will be highlighted later that two ASEAN countries are Just Energy Transition Partnerships (JETPs) countries (Indonesia and Vietnam). There are further important reasons such as the population growth (near 700 million people) in the

region and that this alongside the associated growth in energy demand (3% per year) mean that energy infrastructure investment needed in the region by 2030 is \$150 billion (and circa \$35 billion only to-date) (World Economic Forum, 2024). Indeed, this means that outside of Africa and China, this is the fastest growing area for energy investment in the world.

A major development after COP26 and also COP27 was a new initiative launched across the world in the form of Just Energy Transition Partnerships (JETPs). These are of particular importance in that two of the initial countries developing these are in ASEAN, Indonesia and Vietnam respectfully. JETPs are a tool in essence to mobilise climate finance and they aim in this context to accelerate the just transition to a low-carbon economy. There are a number of countries that have been supported to develop a JETPs and these are: Indonesia Vietnam, Senegal, South Africa and some early discussions with India. Finance has been allocated to the first four (UNECA, 2023). A definition for what a 'just energy investment' is would be a valuable tool for these JETPs.

Further, the just transition issue is important as now countries are developing 'just transition pathways' and this policy was advanced at COP27 at a high-level meeting on considering the implementation of a just transition (UNFCCC, 2023). It was discussed again at the Bonn Climate Change Conference in June 2023 (where informal views were collated). There are a range of differing views over the last year on the scope, timing constraints and content of a potential work programme on a just transition. Many countries have been involved in the discussions, and 169 Parties expressed views on it previously (and including ASEAN countries).<sup>1</sup> It was also discussed at COP28 already where it is stated that the just transition should cover all sectors, some areas should receive priority and that more political support is needed. And this is the case for energy infrastructure development which is a major part of just transition policy.

ASEAN countries have been analysed together in research more and more over the last few years. It is complex work as not always can researchers provide sufficient depth into the countries as they have to spend the time focusing on key research issues. There is of late and in a similar approach to this paper, growing research around critical minerals in ASEAN countries (Abcede and Gera, 2018; Huang, Raza, Hanif, Alharthi, Abbas and Zain-ul-Abidin, 2020; Baz et al., 2022; Dong, Chen and Liu, 2023). This paper analyses energy investment in a similar way to how these countries focus on critical minerals.

### 2.3. A definition for a just energy investment

It is clear that in order to monitor progress of the climate and energy transition that a variety of tools need to be developed. Indeed, also in avoiding energy policy failure, tools that can monitor positive changes to energy systems for example will be transformative. In this context, the JEI definition and model that we develop in this paper to assess the JEI progress of ASEAN countries is an original research contribution and it can enable researchers and policymakers to make improved decisions on ensuring just outcomes from energy infrastructure development.

There is very limited research on just energy investments (JEIs). More recently, this is beginning to shift but what is happening in the policy and commercial world is moving faster than in research. This research advances the definition of a 'just energy investment' which is not in research literature. In developing this concept we base it on

<sup>1</sup> Submissions had been received from the following Parties or groups of Parties: Australia; Brazil on behalf of Argentina, Brazil and Uruguay; Canada; Chile; Colombia; Cuba on behalf of the Group of 77 and China; Indonesia; Japan; Like-minded Developing Countries; Russian Federation; Saudi Arabia on behalf of the Arab Group; Senegal on behalf of the least developed countries; Spain on behalf of the European Union; Türkiye; United Kingdom of Great Britain and Northern Ireland; United States of America; and Zambia on behalf of the African Group.

**Table 1**  
Number of articles on energy justice on the rise.

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>On Energy Justice</b>	3	11	18	45	48	115	124	176	230	287	305
<b>Distributive</b>	–	1	4	6	12	27	27	25	47	51	50
<b>Procedural</b>	–	2	6	14	21	45	37	49	68	88	90
<b>Restorative</b>	–	–	–	–	2	6	7	8	19	36	36
<b>Recognition</b>	–	2	3	5	12	17	21	32	46	74	69
<b>Cosmopolitan</b>	–	1	3	1	1	6	8	3	12	19	21

Note: Some authors refer to distributive justice as ‘distributional justice’.

Source: This data is only from [www.sciencedirect.com](http://www.sciencedirect.com) and was updated to January 2024. It is not exhaustive as includes just one database analysed. However, it is the most accessible and free database to analyse it in this way.

**Table 2**  
The 5 energy justice principles – definitions, application & sources.

Energy Justice Principle	Countries that Apply this	Brief Summary Definition
<b>Distributive</b>	United States, Colombia and South Africa	Cost, finance and affordability should be fair
<b>Procedural</b>	United States, Colombia and South Africa	The legal system provides a platform for each stakeholder to be represented
<b>Restorative</b>	United States, Colombia and South Africa	Prevent and correct environmental impacts
<b>Recognition</b>	United States, and Colombia	Gives a voice to stakeholders (inc. indigenous people)
<b>Cosmopolitan</b>	None yet	Ensures obligations are met across regions and borders

#### Legislation & Policy Material for each Country:

- **United States:** [United States Department of Energy, 2022](#). **Justice40 Initiative Fact Sheet.**
- **Colombia:** [Colombian Ministry of Mines and Energy, 2023](#). **Diagnóstico base para la Transición Energética Justa.**
- **South Africa:** [South Africa Presidential Climate Commission, 2022](#). **Just Transition Framework for South Africa.**

#### References Used by Country:

- **United States:** (1) Walker, G., & Day, R. (2012). *Fuel poverty as injustice: Integrating Distribution, Recognition and Procedure in the Struggle for Affordable Warmth*. Energy Policy, 49, 69–75; (2) Baker, S., DeVar, S., & Prakash, S. (2019). *The Energy Justice Workbook*. Initiative for Energy Justice; (3) Ruano-Chamorro, C., Gurney, G. and Cinner, J. (2021). *Advancing procedural justice in conservation*. Conservation Letters, 15(3); and (4) Hazrati, M., & Heffron, R. (2021). *Conceptualising restorative justice in the energy transition: Changing the perspectives of fossil fuels*. Energy Research & Social Science, 78, 102115
- **Colombia:** (1) Vega-Araujo, J. & Heffron, R. J. 2022. *Assessing elements of energy justice in Colombia: A case study on transmission infrastructure in La Guajira*. Energy Research & Social Science, 91, 102688. and (2) Heffron, R. J. & McCauley, D. 2017. *The concept of energy justice across the disciplines*. Energy Policy, 105, 658–667; and
- **South Africa:** (1) Cahill, B. M. Allen. 2020. *Just Transition Concepts and Relevance for Climate Action*. Washington, D.C.: Center for Strategic and International Studies (CSIS); and (2) McCauley, D. and Heffron, R. J. 2018. *Just transition: Integrating climate, energy and environmental justice*. Energy Policy, 119, 1–7

Source: Created by [Heffron and Sokolowski \(2024\)](#).

theories such as energy justice, the just transition and energy policy failure which are presented in more detail in Section 3, and they permit us to state that: **A Just Energy Investment is where a just energy outcome is secured for society which aligns to energy and climate societal goals over the medium to long-term, and financing is in accordance with a set of just energy principles which will deliver a just transition to a low-carbon economy.**

The just energy principles are the five key principles of procedural, distributive, restorative, recognition and cosmopolitan. These are accepted in the literature across all disciplines (as evidenced by the literature in Table 1) and in policymaking. These principles cover the core areas of ensuring justice in our energy system. In essence they will reduce the change of energy policy failure by ensuring risks are managed successfully for all stakeholders. If justice is applied and visible to all stakeholders, then the risks of injustices from energy activities will be

reduced.

Therefore the importance of a JEI definition should not be undervalued. Such a clear definition can contribute to ‘legal certainty’. This is important to investors who can then make their investment decisions based on the knowledge that:

- (1) a country has a particular medium to long-term energy and climate plan; and
- (2) that they know exactly what type of energy infrastructure they want to ensure they are on the pathway to a just transition; and
- (3) by having such a definition they are planning to lower the risk profile of energy investments through having ‘justice’ at their core.

The legal stability and therefore legal certainty which a JEI definition can provide will be clear for all stakeholders and overall ensure that society is provided with increased just outcomes from its energy investment strategies. We further demonstrate the theory and method in the next section which also provides some further literature review on the energy justice, and other quantitative analysis that aims to explore justice issues too.

### 3. Theory & method: Utilising the JUST framework

#### 3.1. Theoretical framework

This paper aims to utilise the growing interest in ‘justice’ in both research and policy. The reality is that countries all over the world now want to engage in this issue of justice as they think of the impending climate and energy transition needed for their economies. Here, we utilise the documented five energy justice principles that utilised in research which are distributive, procedural, recognition, restorative and cosmopolitanism. These five energy justice principles have crossed into policymaking in three countries, the United States, Colombia and South Africa ([Heffron, 2023](#)) – see Table 2 below.

It is notable also that these three countries have directly borrowed their definitions from key academic and practitioner research articles. We highlight these in Table 2 below as we select a composite of definitions that we utilise for this research.

These five energy justice principles are the first part of using what we refer to as the JUST Framework. The JUST framework allows for more interdisciplinary analysis but also links more with research as it reflects of Space and Time also. It is a framework that can incorporate justice into decision-making that is used in research ([Heffron and McCauley, 2018](#); [Heffron, 2021b](#); [Droubi et al., 2022](#)) and even previously to assess critical minerals in ASEAN countries ([Qurbani et al., 2021](#)). The framework has four key steps which are *Justice, Universality, Space and Time (JUST)* and can be summarised below:

- Justice - distributive, procedural and restorative justice are analysed and these focus more on the systematic change needed to deliver just outcomes.



- **Universality** – this focuses on the who in terms of recognition (local and national stakeholders) and cosmopolitan justice (international stakeholders).
- **Space** – this is where analysis is focused on geographical context of the justice issues
- **Time** – this considers the timeline of the energy and climate transition, and whether energy investment policy is realistic, happening fast enough and in essence analyses the success or not of energy investment strategies.

### 3.2. Method and data collection

The data model we develop for this paper is detailed in [Appendix A](#) specifically. The aim is to explore what a ‘just energy investment’ is. We look at data across the five principles of justice and explore too the issues such as location (utilising population data) and timelines where Governments’ have advanced 2030, 2050 and 2060 targets. Our model in essence indicates how just the energy sector is in the context of energy investments and what it needs to do to increase justice. We provide a score for each of the five principles of justice for each of the ASEAN countries and an overall score for each country which is a just energy investment (JEI) index.

The importance and originality of this research is that while there are significant reports on energy investments produced across the world there is little research on how ‘just’ these investments are – there are some examples of previous research on modelling but they are limited in their perspectives of evaluating justice utilising timelines, justice and ASEAN countries ([Heleno et al., 2022](#); [David, 2018](#); [Castan Broto, Baptista, Kirshner, Smith and Neves Alves, 2018](#); [Fortier et al., 2019](#); [Chapman et al., 2018](#); [Bartiaux et al., 2018](#); [Heffron and McCauley, 2018](#); [Heffron et al., 2015](#); [Jia and Lin, 2023](#); [Hayward and Graham, 2013](#); [Arbuckle et al., 2021](#); [Mandys, Chitnis, and Ravi P.Silva, 2023](#); [Timilsina, 2021](#); [Hallste Perez, Rodriguez-Chueca, and Perez Rodriguez, 2023](#); [Shah et al., 2023](#)). This research provides a pathway of how countries can ensure a just energy transition happens in their countries, and in particular, it provides a research perspective on countries in the ASEAN region which includes the following: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

For a full explanation of what is included in the data analysis, please see [Appendix A](#) which states where the information comes from and how it is weighted in the analysis. Further, we also provide data file (an excel file) which includes all the data involved in constructing the JEI index.

We chose a range of indicators for justice based on what the literature around each energy justice principle is – in terms of reflecting on what the summary definition is in [Table 2](#). We have made our data open-access and included links to the data where relevant. In terms of the modelling, we used specific data for each country. In some cases, we used simple weighting procedures where the focus was on whether there exists law on a particular topic, whereby there were only three categories – a high level of legal from, moderate and no new additions. We also then in an overall examination of justice (presented in [Fig. 6](#)) – we weighted each justice equally (at 20% each) and therefore highlighting that each of the justice principles are equally important.

In brief, this is the data that has been included under each form of justice:

- **Distributive justice:** access to tax authority/ministry; availability of subsidies; availability of tax incentives; subsidies; level of accounting ‘disclosure’; and legislative change between 2015 and 2021.
- **Procedural justice:** access to electricity grid for new energy producer & electricity market design; access to electricity grid for new energy producer & electricity market design; access to regulator/ministry; and legislative change between 2015 and 2021.

- **Restorative justice:** decommissioning/clean-up obligation on any coal, gas, and/or oil project; air quality/emission gap; and legislative change between 2015 and 2021.
- **Recognition justice:** rural v urban projects planned/% population; active policy/legislation for local/indigenous RES development; human rights/poverty index; and energy access.
- **Cosmopolitan justice:** meeting Paris Agreement target; electricity grid investment; planned clean investment across transport, industry, residential; and national net zero obligations.

## 4. Results & analysis

The results of our analysis which includes the data analysis across the 10 ASEAN countries involves the development of a JEI index for these countries, and one that could equally be applied for other countries. This is one of the first to focus on developing countries and also the ASEAN region. Further, the data collection process is far more comprehensive than previous literature and also far greater grounded from a theoretical perspective. The results are examined within the context of the five forms of justice from the JUST framework before an overall results perspective presented in the rest of this section. The other components of the JUST framework are Space and Time which are both incorporated within the data analysis for this JEI index.

### 4.1. Distributive justice

As stated in Section three is a range of data analysed in terms of distributive justice. In general, there is a focus on finance in terms of distributive justice and addressing societal inequality from this aspect, i. e., income distribution, energy affordability and taxation. In order for that to happen there are certain characteristics that need to be addressed in financial systems and hence, within the framework adopted here access to the relevant ministries and also disclosure are seen as vital cogs to obtaining distributive justice.

The analysis also includes the availability of tax incentives and whether new legislation has been introduced in this area since the 2015 Paris Agreement until the end of 2021. This is particularly important as it will identify if Governments have been creating the opportunity for new low-carbon energy infrastructure development. To develop new energy projects a range of tax incentives can encourage both external and internal investment in the energy sector. In terms of the results, which are displayed in [Fig. 1](#) below, it is clear that there are a number of countries that are performing well, such as Indonesia, Malaysia and the Philippines.

The performance of these three latter countries is higher than the ASEAN average because they perform higher in terms of one particular issue, and that is changes in legislation. It shows that changing legislation can have a positive impact in achieving change – in essence, it provides the investor with the aforementioned legal certainty (see [Section 2](#)) needed in order for them to make an investment. Another key metric is around tax incentives which both Indonesia and the Philippines have in common. This could be disputed as clearly some tax incentives remain for fossil fuels in the region, but overall, there is evidence of more success in green energy infrastructure development in the more successful countries on this distributive justice index. And finally, related to taxation, all three countries have more transparency in governance and on accounting procedures which one would expect then to have a positive performance for increasing distributive justice.

Many of the other ASEAN countries are behind those three although not too far behind in terms of percentage. However, what is revealing is that the introduction of new legislation to address distributive justice issues has not been addressed in these countries. In this context one can determine that there continues to be an element of a ‘business-as-usual’ approach by many countries. The question arises, are these countries doing enough and certainly there is some discussion on whether the countries in the region are doing enough? In order to meet energy and

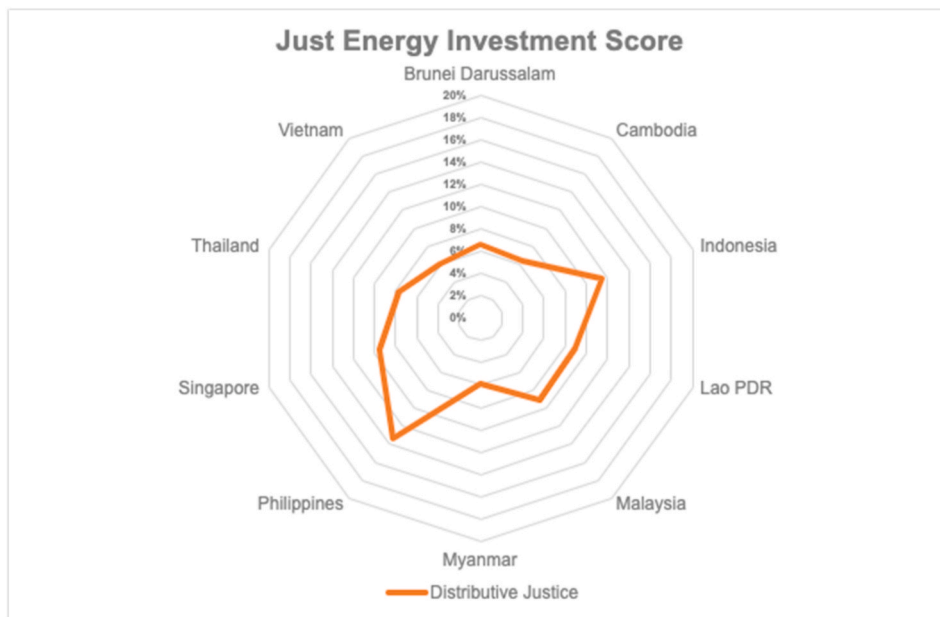


Fig. 1. Distributive Justice – Index score – ASEAN countries. Source: Created by Authors (2023).

climate goals there has to be recognition of the recent major UN report on the climate emergency. To respond to such an emergency, one would expect legislative change (Intergovernmental Panel on Climate Change, 2022). There is a range of new policy and plans around further developing a green energy transition, but these need to be supported by legislative change. Achieving change to the acceleration that is needed on green energy means that more progressive legislation is needed, and then the door would open for more investors – and banks who support such green growth in the region already have been shown to have improved financial performance (Rahat and Nguyen, 2023).

#### 4.2. Procedural justice

The scope of procedural justice is well-documented in the literature, and it involves in essence the functioning of the legal system where the values of justice are properly in place such as equity, fairness and inclusiveness. Hence, a key issue here is that energy companies should all have the same access to the electricity grid and also that their role is incorporated in the electricity market design. Too often in ASEAN new producers of energy – and in many cases low-carbon energy sources and companies – have restricted access to the grid and/or alternatively have to compete in a marketplace designed for incumbents. Further, they have to compete at some low price for electricity which is in place due to heavy subsidies given at different points in the energy life-cycle to the

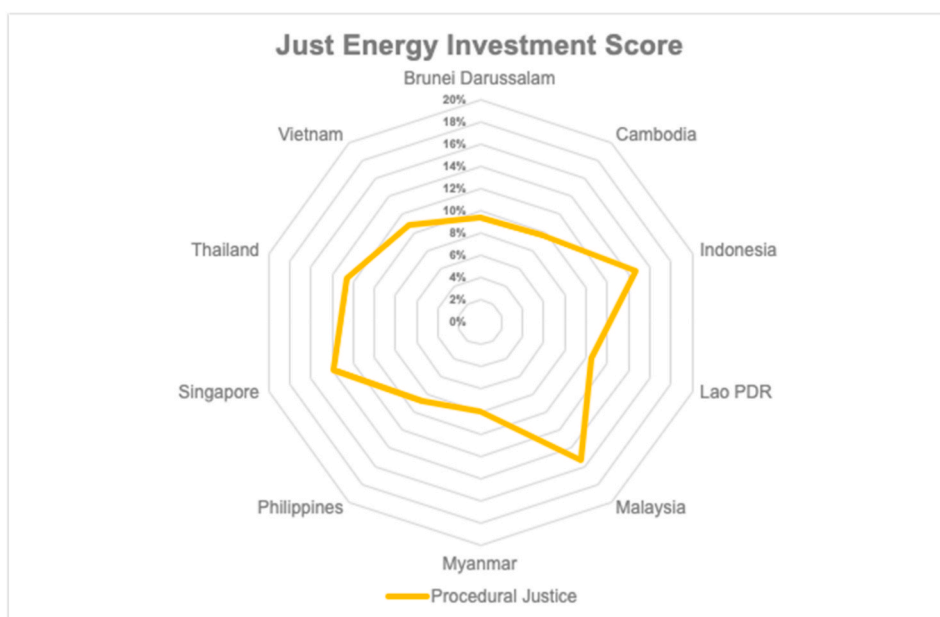


Fig. 2. Procedural Justice – Index score – ASEAN countries. Source: Created by Authors (2023).

market incumbents (conventional fuel sources). In this context and in examining procedural justice data in Fig. 2 below, it is evident that there is still significant improvement possible for the majority of ASEAN countries.

In ASEAN countries and similar to many parts of the world, the energy sector still has the remnants of having state owned enterprises (SOEs) that operate or have operated in the energy sector and where adjustment to the energy transition is slow. The transformative step needed here is in giving low-carbon energy sources access to the electricity grid in a fair cost approach (and whether the owner is an SOE or not). To support this transformative step requires legislative change and effective enforcement of that legislation. This latter area remains a work-in-progress, and currently based on the data Indonesia, Lao PDR, Cambodia and Malaysia have been making changes to legislation. Perhaps, therefore as these legislative changes take effect the practice of procedural justice may be more evident as 2030 appears closer on the horizon.

Policy reform has been slow in the area, and this is why for procedural justice more work is needed. For example, there needs to be action on the design of electricity market where policies that encourage entry for renewable energy are developed as currently there is not sufficient new introduction of law to ensure that this happens. Equally and perhaps apart from Vietnam and Indonesia, certainty should be provided around plans to phase out fossil fuels (particularly in light of the recent UN COP28 conference) and how this will be achieved effectively from a procedural justice perspective. Such a plan would also provide a framework for energy market organisation that enabled low-carbon energy development through faster processes.

### 4.3. Restorative justice

Restorative justice is one of the most exciting aspects in terms of exploring the presence of justice in the energy sector. It aims to solve the problem of the damage that energy projects have on society; in terms of pollution and consequently, on the health of the human population and the environment. Recognition justice calls for the costs of such damage to be included at the outset of a project. For example, the costs of waste management whether it be decommissioning or carbon dioxide emission reduction should be factored into the overall project costs at the outset

of a project – and including associated costs with community relations. In this regard, projects should have a social licence to operate over the project lifecycle, i.e., from extraction to production to operation to consumption to waste management.

From Fig. 4 above it is clear that the application of restorative justice is a major gap within energy policy frameworks in ASEAN countries; and indeed it is an area of weakness across the world. In ASEAN there is little action here by many countries. The issue here is that it concerns the balance of the relationship between stakeholders, i.e., the company, the government and the public. In ASEAN it seems that the Government and the people are taking on the risk and responsibility for decommissioning, waste management and environmental impacts. There has to be a recalibration here whereby the companies are taking on more of these risks, i.e. there needs to be more clarity on the *reward-risk-responsibility* relationship for ASEAN stakeholders (Heffron, 2024). Without this being the case, conventional energy sources will appear cheaper in the region due to a lack of restorative justice, as this means these energy sources are not paying for the damaging and costly externalities that they produce. The perception remains and abounds therefore of conventional energy sources being low-cost and a fast solution to solving energy demand. Even if in some countries the energy companies are state-owned, they have to begin revising their energy project/energy production data to include restorative justice as otherwise fossil fuels will retain an illusory positive cost comparison with low-carbon energy projects and production.

In exploring Fig. 3, Malaysia is perhaps an outlier to some degree but it has more advanced policy and law on decommissioning and also on carbon dioxide management (i.e., a carbon tax). This demonstrates the positive impact new law and policy can have, and despite in 2015 ASEAN countries accepting the reality of new energy and climate targets for 2030, there has been little change to lower the environmental impacts from energy use and ensure more accountability to developing energy in a more ‘just’ way. Singapore too is aggressive on carbon taxes but has little on decommissioning. Overall, as stated earlier it is an area of underperformance for ASEAN countries. However, it should be taken into account that it is an area that the majority of countries all across the world are struggling to deliver on. There is significant action needed here, and it is why one of the benefits of renewable energy has to realised in that it as an energy source has lower costs of decommissioning and

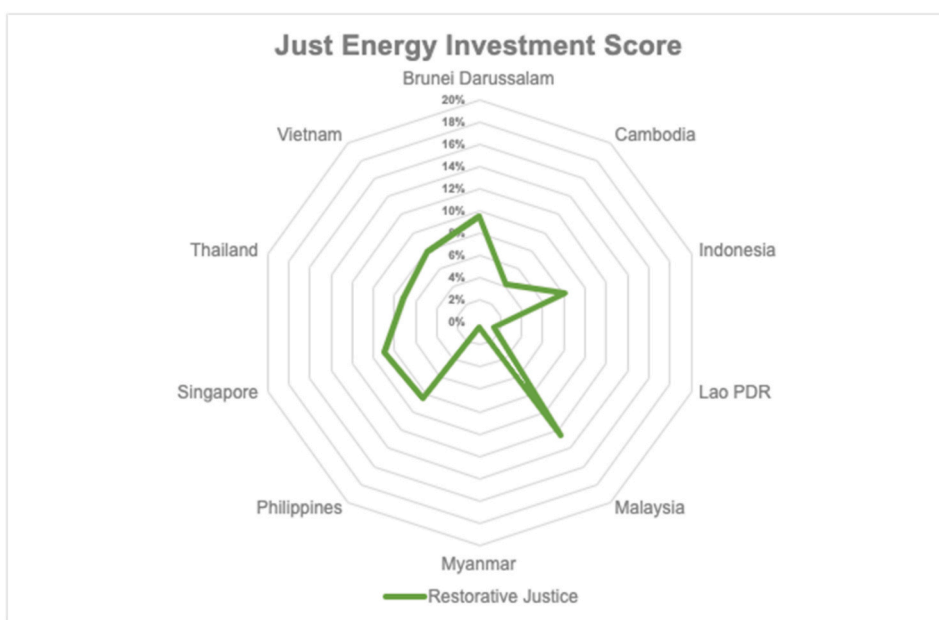


Fig. 3. Restorative Justice – Index score – ASEAN countries. Source: Created by Authors (2023).

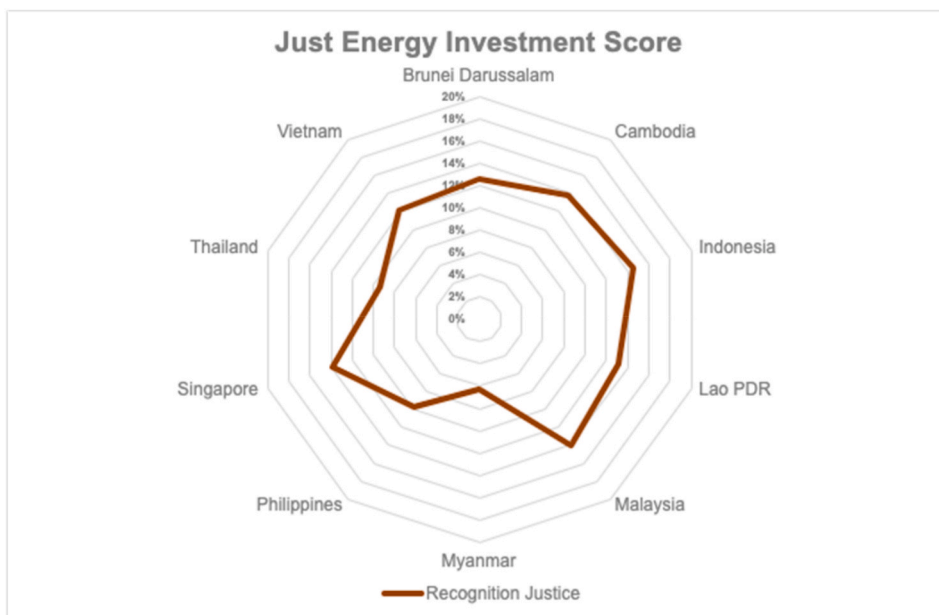


Fig. 4. Recognition Justice – Index score – ASEAN countries.  
Source: Created by Authors (2023).

waste management. Such benefits need to be introduced fully into economic modelling in terms of the true cost of projects in the short, medium and long-term.

#### 4.4. Recognition justice

The JEI score for recognition justice for ASEAN countries demonstrates that there has been clear action to improve this type of justice, See Fig. 4. There is increasingly the perspective across ASEAN countries that more of the population need energy access to be able to enjoy their general rights within society such as have the opportunity to work, have a family life etc. These rights too are extended to indigenous communities. In the metrics used to calculate the JEI scores it includes various data points so as the human rights and poverty index and on energy access, and all these show that ASEAN countries are on the rise in terms of these issues.

Further, in terms of an increase in policy and legislation around indigenous communities specifically, it is clear that progress has been made. In particular, Cambodia, Lao PDR, Vietnam and Indonesia have made progress on this regard, as is demonstrated in Fig. 4. There still remains further data to be collected on to what degree such legislation and policy is enforced. Yet still the positive is that legislation has been introduced and/or revised recently in the area. There is a realisation that local communities have a vital role in the energy system it is not yet clear how that will transpire at the end of the life-cycle of energy infrastructure in the majority of ASEAN countries – i.e., where the overlap will be with restorative justice – but there is time for that legislation to be introduced.

Nevertheless, what is clear is that indigenous and other local communities are increasingly being factored into decision-making on energy project developments. This needs to continue, and there is evidence that rural populations are being targeted more in terms of energy access, electrification and clean cooking as demonstrated by the data. And at the same time there are numerous low-carbon initiatives across different cities in ASEAN recognising that urban life communities need to be part of the just energy transition. Indonesia perhaps faces greater challenges with ensuring that indigenous and island communities are part of the just energy transition but it has been progressive on developing new policy in the area. Whether these changes and/or revisions have been

effective it will need more time to ascertain (perhaps at 2028 or 30, a more complete picture will emerge on its success or note.

#### 4.5. Cosmopolitan justice

The cosmopolitan justice metric is clear in that it refers to commitments made at a national perspective in accordance with international standards, laws or treaties. It is a justice that reflects us as global citizens or as was stated within cosmopolitan philosophy, citizens of the world. In this context a range of metrics were compiled beginning with the targets set by each country from the Paris Agreement 2015. Further associated targets are also chosen such as planned clean investment in different economic sectors such as industry, transport and residential. Finally, one of the more recent targets in this area is included which is that national net-zero targets that countries began to introduce for UN COP26 in Glasgow (UK) as they are required to every five years after 2015 Paris Agreement – it happened one year later because of COVID-19.

The data behind Fig. 5 demonstrates that it is positive that ASEAN countries are committed to national action as a result of international treaties but how these national actions are enforced is open to question. This is why overall in this cosmopolitan justice JEI, many ASEAN countries are not achieving progress where they should be. For example, it is evident that while many of these countries have clear NDC targets, the supporting legislation to bring change is not either not present or lacks enforcement or there is not the capacity or tools of enforcement. This is why the overall JEI cosmopolitan score is low as there still remains so much improvement needed in key areas such as transport, specific planned renewable energy investment and net zero obligations.

In particular, net-zero plans are an issue. Such plans are a statement of long-term commitment to the energy transition and to the Paris Agreement. These would give investors a sign of legal certainty and therefore the confidence they will see a return on their investment. This lack of long-term strategic thinking may be a reason as to why renewable energy investment is still low in many of these countries – apart from some success stories on clean energy development in Vietnam and Indonesia in particular. Indeed, it is the lack of application of some of the laws and policies introduced post 2015 that may be lowering the attractiveness in ASEAN countries in new energy investment. More



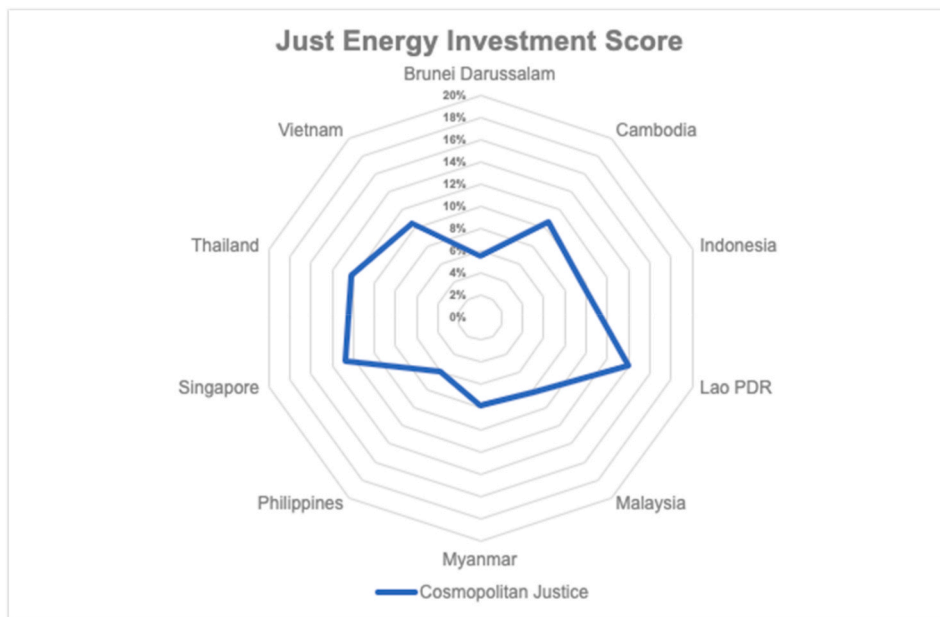


Fig. 5. Cosmopolitan Justice – Index score – ASEAN countries. Source: Created by Authors (2023).

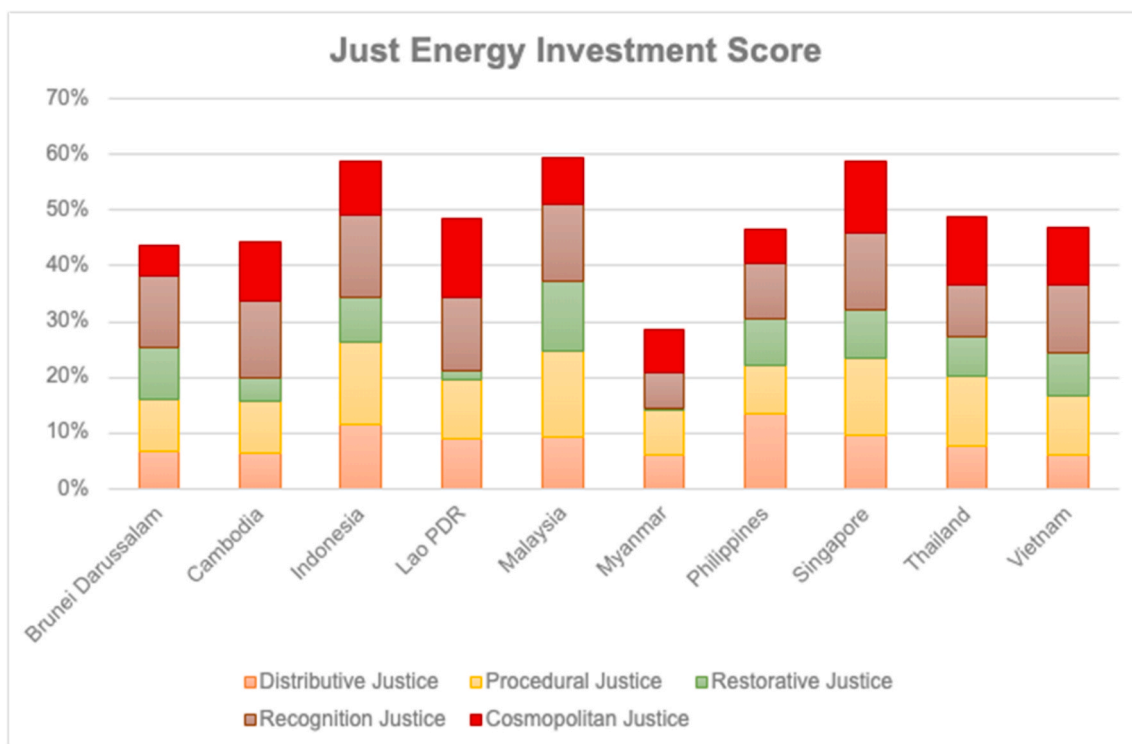


Fig. 6. Just energy index for ASEAN countries. Source: Created by Authors (2023).

specifically, if investors are unsure the new post 2015 energy laws and policies will deliver for 2030, they may be, equally unsure of making investment decisions for unclear 2050/2060 net-zero plans. Overall, ASEAN countries would benefit from creating a new approach to attracting collectively new energy investment.

The complete conditions for JEIs are not yet present to support ASEAN countries to keep the commitments they made in order to meet energy and climate targets. In order to effect change and secure

increased international finance into the energy sector, progress will be needed that demonstrates a medium to long-term commitment. Stable investment coming into these countries could be transformative for economic growth and also to fully transition the economy to be low-carbon. More flexible and succinct just transition pathways to a low-carbon economy should be established and placed into policy, and perhaps over 2024 that will happen in time for UN COP29 and beyond.

### 5. Conclusion & future outlook

This research focuses on ASEAN countries and researches their plans on energy and climate change. In essence, the focus is on their energy infrastructure investment strategies and whether they deliver just outcomes for society in the medium to long-term. In order to assess this, we have defined what a ‘just’ energy investment is and we utilise five ‘justice principles to achieve this. Justice is fast becoming a central policy feature around the energy and climate transition, with it being a key topic for the UN COP28 conference. Further, we note that three countries are utilising four out of the five justice principles that we are basing our work on – in the US, Colombia and South Africa respectively.

We therefore have advanced a definition for a ‘Just Energy Investments’ where we define it as: *where a just energy outcome is secured for society which aligns to energy and climate societal goals over the medium to long-term, and financing is in accordance with a set of just energy principles which will deliver a just transition to a low-carbon economy.*

The research here assesses the 10 ASEAN countries and their performance in terms of delivering ‘just energy investments’. The countries and their energy sectors were assessed according to five energy justice principles which include: procedural, distributive, cosmopolitan, restorative and recognition. The results in the form of a Just Energy Investment (JEI) score that is stated below in Fig. 6. The indication is that overall collectively ASEAN countries are performing well but with still areas to improve – Myanmar is not performing well but there is a caveat however, that may in part be due to the difficulty in collecting the data over the data collection period up to the end of 2021.

What is visible within the data is that there is an area of under-performance is restorative justice. This reflects a need for energy which has been prioritised over environmental impacts as noted in a landmark report by the Asian Development Bank (Asian Development Bank, 2023). Today, however, restorative justice should be applied at the outset of a project and therefore key issues and costs of decommissioning and waste management would be included in the evaluation of energy projects. This would result in the costs of traditional energy sources rising significantly and low-carbon energy projects would therefore compete on price if not be lower. Currently, such an approach to costing energy does not exist and therefore conventional energy sources remain cheap in appearance and therefore a key option within national energy policy frameworks. The value of the JEI index will demonstrate over time which countries begin to make real progress in transforming their energy mix and ensuring that just energy investments are central to their energy portfolio.

From Fig. 6 it is also clear that there is scope to improve both procedural and distributive. They are interlinked to a degree but there more of the benefits from the energy sector need to reach more of the ASEAN population. There needs to be new legislation and/or revised legislation in the area whereby it supports changing the ‘business-as-usual’ approach – and this links with earlier research around concerning justice and company behaviour highlighted in the introduction (Sokolowski and Taylor, 2023; Heffron, 2021a). The fossil fuel pathway have been

### Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.indic.2024.100367>.

### Appendix A. Outline of Model for formulating a Just Energy Index (JEI)

A. Distributive Justice				
No	Variable	Weighting %	Further Detail	Total
1	Access to Tax Authority/Ministry	4	Ministries & WBank Data	

(continued on next page)

over exploited and some its benefits are a chimera with environmental impacts needing to be lowered alongside finance and taxation moved to enabling low-carbon energy sources.

It is worthwhile noting the importance of the focus on energy investments due to the ongoing energy transition. As stated earlier, significant amounts are needed with some as high as \$120 trillion, estimated for 2015–2050 (IRENA, 2016), globally for the energy transition. This is the first research to delve into what a ‘just energy investment’ is and explore how ASEAN countries are trying to ensure justice happens in energy development. The research identifies some clear successes to-date and points a way forward to increasing the spread of low-carbon technologies. It is also of particular relevance to the emerging advance of the JETPs which are beginning to develop (with two in ASEAN in Indonesia and Vietnam). The JEI index could be a valuable tool in assessing the performance of JETPs as it will highlight in those pathways which types of justice need to improve, how energy policy failure can be avoided and how risk can be managed effectively across the different stakeholders.

### CRedit authorship contribution statement

**Raphael J. Heffron:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Monika Merdekawati:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Data curation, Conceptualization. **Beni Suryadi:** Writing – review & editing, Supervision, Resources, Project administration, Conceptualization. **Zulfikar Yurnaidi:** Writing – review & editing, Supervision, Project administration, Data curation, Conceptualization.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data availability

Data will be made available on request and is available in the link below.

### Acknowledgements

The authors wish to thank ASEAN-ACE ACCEPT project for funding for this project including the Ministry for Foreign Affairs of Norway [grant numbers RAS 2805 RAS 17/0013, 2018]. Further, the authors would like to thank a range of different assistants for the collection of some for the data for this project. The authors would like to thank all the reviewers involved in the process.

(continued)

A. Distributive Justice				
No	Variable	Weighting %	Further Detail	Total
2	Availability of Subsidies	5	Data	
3	Availability of Tax Incentives	5	Data	
4	Level of Accounting 'Disclosure'	2	2,1,0	
5	Legislative change since 2015	2	2,1,0	
6	Plans for Legislative change post 2021	2	2-3 new laws	
	-		2,1,0	
	<b>Total (out of 20%)</b>		<b>2 new plans/policies</b>	
B. Procedural Justice				
No.	Variable	Weighting %	Further Detail	Total
1	Access to Electricity Grid for new energy producer	4	4,2,0	
2	Electricity Market Design	2	2,1,0	
3	Cost of Doing Business	10	WBank Data	
4	Access to Regulator/Ministry			
	Legislative change since 2015	2	2,1,0	
5	Plans for Legislative change post 2021	2	2,1,0	
	<b>Total (out of 20%)</b>			
C. Restorative Justice				
No.	Variable	Weighting %	Further Detail	Total
1	Decommissioning - Clean-up obligation on any coal, gas, and/or oil project	10	10,5,0	
2	Air Quality	4	4,2,0	
2	Carbon Tax & Pricing - Legislative change since 2015	3	5,3,1	
3	Plans for Carbon Tax - Legislative change post 2021	3	5,3,1	
	<b>Total (out of 20%)</b>			
D. Recognition Justice				
No.	Variable	Weighting %	Further Detail	Total
1	Rural v Urban Projects planned/%population	5	Data	
2	Active policy/legislation for local/indigenous RES development	5	5,3,1	
3	UN Human Right/Poverty Index	5	Data	
4	Energy Access (WHO)	5	Data (90/10)	
	<b>Total (out of 20%)</b>			
E. Cosmopolitan Justice				
No.	Variable	Weighting %	Further Detail	Total
1	Meeting Paris Agreement Plans (Now & 2030)	10	Data	
			5,3,1	
2	Planned Investment FF & RES: Ratio-2030, Ratio-2040, Ratio-2050	2	Data/5,3,1	
3	Electricity Grid Investment	2	Data/2,1,0	
4	Planned Clean Investment across: Transport; Industry; Residential	4	Data	
5	National Net Zero Obligation	2	2,1,0	
	<b>Total (out of 20%)</b>			

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