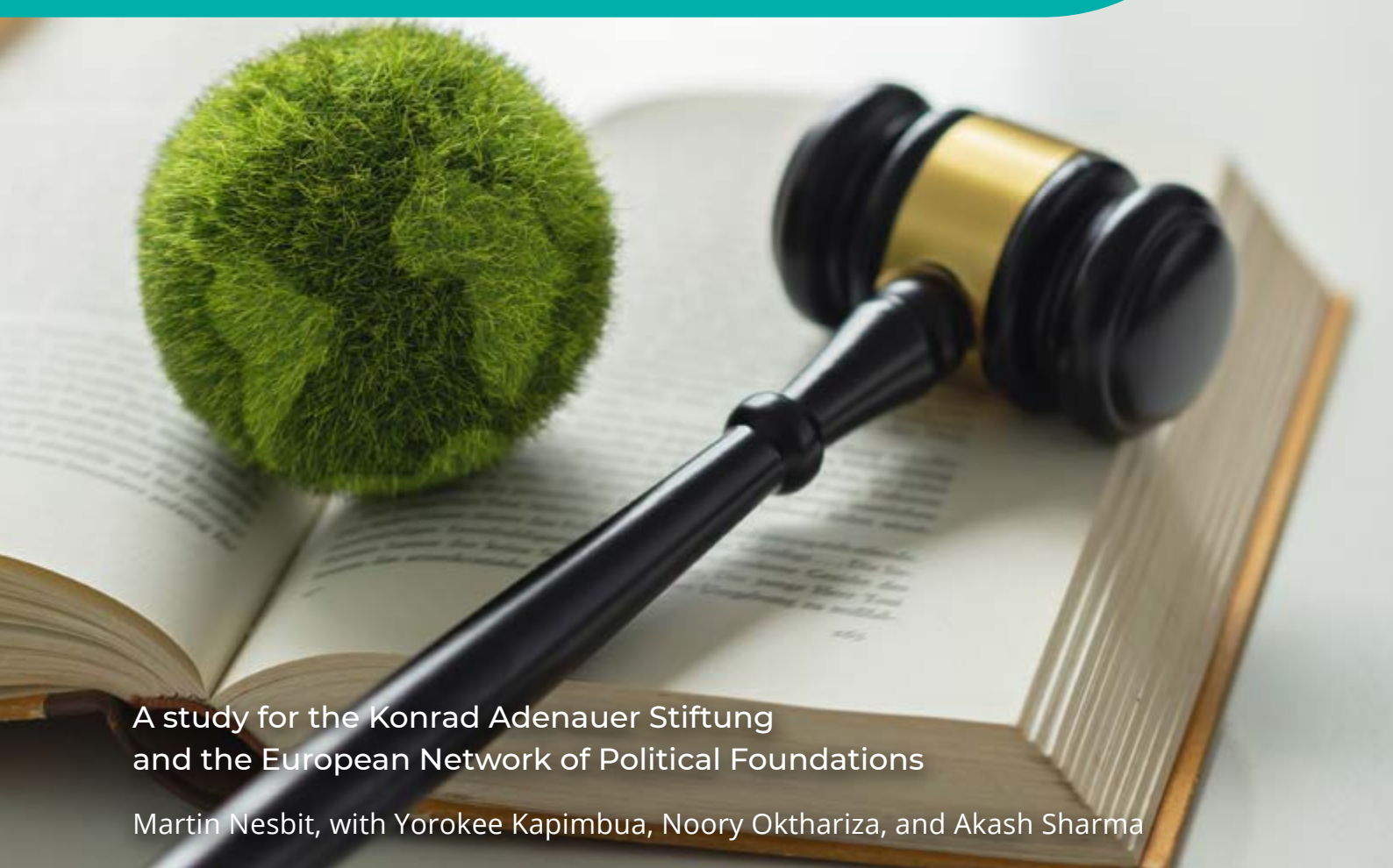


Democracy and Climate Change: Lessons Learned from 3 “Flawed Democracies” (India, Indonesia, and South Africa)

A photograph of a black gavel with a gold band resting on an open book. To the left of the gavel is a spherical object covered in bright green moss. The book is open, showing text on the pages.

A study for the Konrad Adenauer Stiftung
and the European Network of Political Foundations

Martin Nesbit, with Yorokee Kapimbua, Noory Okthariza, and Akash Sharma

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Summary and Recommendations

Current global efforts to mitigate climate change are clearly insufficient to achieve the objectives of the Paris Agreement. Concerns about the slowness and ineffectiveness of decision-making have been voiced by climate activists and scientists, with a particular focus on the failure of democracies to act more quickly. A substantial body of research has developed on the question, which broadly points to a conclusion that democracies are less ineffective than other systems of government at tackling climate change, and that their effectiveness is lower when there is significant corruption.

The urgency of the climate crisis does not, however, allow time for us to consider an improvement in governance systems as a necessary precursor to effective action. This report aims to begin a process of identifying mechanisms for improving decision-making that are relevant to different types of governance system. Based on a template for assessing climate action in a broadly comparable way in different countries, we have looked at progress in three so-called “flawed democracies”: India, Indonesia, and South Africa. The template, which can be used across all regime types, addresses overall governance characteristics and environmental and climate decision-making, before looking in detail at how decisions are taken in transport infrastructure, in renewable energy investment, and in household energy efficiency policy. The country reports are included as annexes to this report.

Common issues identified in our three countries include:

- A lack of political salience for the climate issue;
- Barriers to addressing fossil fuels due to significant vested interests in extractive industries, and the political relevance of employment in those industries;
- Incoherences in climate policymaking, including a disconnect between policy in individual sectors and national mitigation targets, and in some cases a lack of cooperation between national and regional levels of government.

The report offers suggestions on approaches which could be used (and are in some cases already being pursued) by advocates of climate action in the three countries. These include: testing the effectiveness of constitutional provisions on environmental rights; a focus on the co-benefits of climate mitigation in terms of addressing health and poverty; and an emphasis on the “just transition” approach to address the interests of those who see themselves as losers from the clean energy transition. Sharing of experience and analysis by climate activists across regimes of a similar type should be deepened.

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1. Introduction

The world is collectively acting too slowly to address the challenges posed by the climate crisis:

“A substantial ‘emissions gap’ exists between global GHG emissions in 2030 associated with the implementation of NDCs announced prior to COP26 and those associated with modelled mitigation pathways that limit warming to 1.5°C (>50%) with no or limited overshoot or limit warming to 2°C (>67%) assuming immediate action (*high confidence*). This would make it *likely* that warming will exceed 1.5°C during the 21st century (*high confidence*).”¹

Is this because of democratic constraints on rapid action? From an early stage in international action on climate mitigation, there have been voices expressing frustration at the slowness of the response from liberal democracies. Frustration in the scientific community about the slowness of the policy response led to some high-profile suggestions that democracies were ill-equipped to act fast enough. Thus, prominent climate modeller James Hansen said in 2009:

“The democratic process doesn’t quite seem to be working. The first action that people should take is to use the democratic process. What is frustrating people, me included, is that democratic action affects elections but what we get then from political leaders is greenwash.”²

And James Lovelock, author of the Gaia theory, expressed similar impatience in 2010:

“I have a feeling that climate change may be an issue as severe as a war. It may be necessary to put democracy on hold for a while.”³

The ground-breaking 2009 study by Anthony Giddens, “The Politics of Climate Change”, tackled this issue. He noted that: “Some environmentalists argue that liberal democratic societies are not equipped to cope with ecological problems, especially climate change, given the far-reaching character of the social and economic reforms that will be needed.”, and quoting an earlier study on “The failure of democracy”, which stated :

“For us, freedom is not the most fundamental value and is merely one value among others. Survival strikes us as a much more basic value.”⁵

1 Synthesis report of the IPCC 6th Assessment Report, Summary for Policymakers

2 [Adam, D., ‘Nasa’s James Hansen Warns “democratic process isn’t working” in climate change fight’, The Guardian, 18 March 2009, accessed 23 June 2023](#)

3 [Hickman, L., ‘James Lovelock: Humans are too stupid to prevent climate change’, The Guardian, 29 March 2010](#)

4 “The Politics of Climate Change”, A Giddens, 2009.

5 Shearman D, Smith W (2007) “The Climate Change Challenge and the Failure of Democracy”

Giddens points out that:

“Totalitarian states have generally had poor or disastrous environmental records. So also have most of those that have undergone processes of ‘authoritarian modernisation’ such as China, Russia, or South Korea”.

In other words, we find ourselves facing the problem famously outlined by Winston Churchill:

“Many forms of Government have been tried, and will be tried in this world of sin and woe. No-one pretends that democracy is perfect or all-wise. Indeed, it has been said that democracy is the worst form of Government except all those other forms that have been tried from time to time.”⁶

This is a familiar quotation, but Churchill’s comments in his speech immediately before the text above are particularly relevant to those frustrated by democracy’s slowness in tackling climate change:

“All this idea of a handful of men getting hold of the State machine, having the right to make the people do what suits their party and personal interests or doctrines, is completely contrary to every conception of surviving Western democracy. ... We accept in the fullest sense of the word the settled and persistent will of the people. All this idea of a group of super men and super-planners, such as we see before us, “playing the angel,” as the French call it, and making the masses of the people do what they think is good for them, without any check or correction, is a violation of democracy.”⁷

Experts who – rightly – express frustration at the slowness of democracy’s response to the climate crisis tend to assume that an alternative government by the right kind of experts is readily available. It is not. And even if it were, such a government would lack the legitimacy necessary to secure enthusiastic implementation of low-carbon solutions.

While there is evidence to suggest that democracies tend to be less bad at addressing climate change than other forms of governance, the urgency of the climate crisis does not allow us the option of calling for a global transition to democratic norms as a first step. The challenge facing those of us who are frustrated by slow progress is to make all systems of government work better. This project aims to find mechanisms to do that, relevant to a range of different types of government system.

⁶ House of Commons, Hansard, 11 November 1947, [columns 206-207](#).

⁷ Ibid, column 206.



1.1. A Brief Survey of Literature on The Democracy/Climate Action Nexus

There is an extensive body of research and analysis on the links between government types – particularly democracy – and the effectiveness of environmental policy, including climate mitigation. A useful summary of the issues covered is provided in the discussion paper “Democracy and the Challenge of Climate Change”⁸ by David Lindvall for the Institute for Democracy and Electoral Assistance. The paper notes that while the record of democracies in delivering on climate mitigation is mixed, studies tend to confirm a positive correlation between democracy and climate mitigation; in other words, other regimes are worse. However, democracies with a high level of corruption, or with an influential fossil fuel industry, tend to perform less well.

One of the challenges climate action poses for democracy is that, according to Lindvall, “Democracy is a system limited by time and space, while the problem of climate change runs across generations and national borders”. In other words, we are back to what Giddens (in “The Politics of Climate Change” referred to in the introduction) refers to as a paradox:

“Since the dangers posed by global warming aren’t tangible, immediate or visible in the course of day-to-day life, however awesome they may appear, many will sit on their hands and do nothing of a concrete nature about them. Yet waiting until they become visible and acute before being stirred to serious action will, by definition, be too late”.

Over the intervening years since those words were written, the impacts of climate change have become more tangible and visible, but the central challenge – that the benefits of action now will be enjoyed in the form of costs avoided sometime in the future, and not necessarily by the same people affected by the costs of the action – remains the same.

Comparing the relative performance of democracies and other regime types is challenging, because of the wide range of potential confounding factors (differences in development, history and geography). However, studies which have looked into this question from the perspective of economic statistics⁹ have tended to find that democracies perform slightly better, and (as noted above), that this applies principally where democratic systems are not affected by high levels of corruption. The ground-breaking historical study “Carbon Democracy”¹⁰ looked at the relationship between the emergence of

8 “Democracy and the Challenge of Climate Change”, International IDEA Discussion Paper 3/2021, David Lindvall, 2021

9 See for example Selseng, T, “Unpacking democracy: The effects of different democratic qualities on climate change performance over time”, *Environmental science & policy*. Volume 128: (2022, February),

10 *Carbon Democracy*, Mitchell T, 2013

democracy during and following the industrial revolution, and the struggle for control of fossil fuels. Where control over the extraction and production of energy - a key factor in wealth creation - can be concentrated in relatively few hands, the potential for corruption expands significantly. The disruption and radical shifts in economic power implied by a decarbonisation of the global economy threaten those with control over resources. And while in democratic regimes they can use levers such as lobbying, the funding of political parties, and so on, the levers potentially available to them in other regime types can be even more powerful (particularly where they are not just trying to influence power structures, but already control them).

So perhaps we should not be surprised by the evidence that, slow though democracies have been to respond to the urgency of the climate crisis, the relative performance of other regime types has been worse. While recent research into “environmental authoritarianism”¹¹ suggests that in some non-democratic countries a degree of real commitment to protecting the interests of future generations has emerged, this appears to be the exception rather than the rule. This project, by comparing concrete examples of climate policy performance across different countries and different regime types, aims to throw light on how to improve that performance in ways that are adapted to the relevant regime type. We focus here on three “flawed democracies”. The literature we have examined suggests some of the issues that may emerge:

The complexity of the climate change problem

Climate change, and the urgency for climate mitigation action, has been described by many commentators as a “wicked problem” - an over-used shorthand for issues which are complex, due to (variously) their multi-scalar, multi-causal, and interdependent nature; the extent to which they have multiple stakeholders with conflicting agendas, concerns, and degrees of urgency; and the existence of positive and negative feedback loops. The essential challenge of such problems is that they won't sit still; and that solving individual aspects of them can generate additional challenges. Arguably, the complexity of climate mitigation is a reflection of the scale of change needed in the productive capacity and resource use of each economy.

One issue faced by many democracies currently is the emergence of political narratives which seek to frame issues in terms of simple choices which appeal to tribal loyalties - the Trump regime in the US and the current direction of

11 See, for instance, Carlitz R & Povitkina M, “Local interest group activity and environmental degradation in authoritarian regimes”, *World Development*, Volume 142, 2021; Ping Huang & Yig Liu (2021) “Toward just energy transitions in authoritarian regimes: indirect participation and adaptive governance”, *Journal of Environmental Planning and Management*, 64:1, 1-21; Gilley, B (2012) “Authoritarian environmentalism and China's response to climate change”, *Environmental Politics*, 21:2.



the Republican party being a prime example, with echoes in populist regimes in Brazil, Italy and the UK. There is significant potential for voter impatience with issues which are complex. Misinformation about simple solutions which avoid challenging cultural assumptions (in the case of climate, the simple solution is often to claim that the problem doesn't exist, or that the issue is exaggerated) has been shown to be a politically powerful tool. Some countries have aimed to take the politics out of climate change, either by establishing independent bodies to advise governments (in the UK, and subsequently in a range of countries including Austria, France and New Zealand¹²), or by setting up randomly selected citizen assemblies (eg Ireland, France, Spain), with a degree of success.

The global nature of climate change

A key challenge for democratic responses to the climate crisis is that the problem – both the impacts, and the costs of addressing them – is at a global scale. Individual countries cannot “solve” the problem for their own citizens. There is a risk of free-riding,

12 See Dudley H, Jordan AJ, Lorenzoni I: “Independent expert advisory bodies facilitate ambitious climate policy responses”, in “Critical Issues in Climate Change”, March 2021.

due to the absence of global enforcement mechanisms to tackle countries which fail to commit to their share of action, or fail to deliver on their commitments. And there is the problem that determining what represents a “fair share” of effort for each country involves complex and debatable moral choices, both about historical responsibility and the equitable distribution of current costs and finance. Economically optimal mechanisms to address polluting activities may appear to create economic distortions, harming local producers and making it hard for them to compete with rivals in economies with weaker policies. While these challenges apply to all regime types, in democracies they create a negative potential feedback on public support for action, particularly when associated with the populist approaches referred to above.

The problem of short-termism

Democratic systems are characterised by regular periodic opportunities for regime change; this in turn can lead to short-termism in decision-making (for example, timing spending or tax cuts to influence an election). As Lindvall puts it: “democratic governance may also exacerbate the problem of short-termism, since most liberal democracies are institutionally designed to prioritize issues that are currently topical and do not reward long-term problem-solving”. This may, in countries with regionalised systems of government, be exacerbated by differences in political control at national and sub-national level. And climate change is, as we have seen, a long-term problem, requiring consistent government action over a long period to deliver decarbonisation, and where the benefits of policy success are not felt by current electors as much as by electors in the future. Or, to quote Lindvall again:

“Those who may live to see the end of this century - the time when the more gruesome effects of the climate crisis are expected to occur - are still not eligible to vote. Opportunistic politicians will therefore be more motivated to listen to the interests expressed by older constituencies”.

The advisory bodies or citizens assembly approaches referred to above can, in addition to their other benefits, also help to address this short-termism. And, while democracies are often insufficiently effective, they are nevertheless likely to be more effective than other types of regime. In authoritarian regimes, for example, powerful incentives to short-termism apply: the population needs to be kept happy, to avoid the risk of regime change; and individuals at different levels of the hierarchy are assessed on the basis of their current performance. Moreover, where significant corruption is present, the opportunities for

securing financial benefits need to be exploited by powerful individuals while they wield power..

Policy capture and corruption/ fossil fuel dependence

There is an extensive literature on the impact of corruption on policy development and implementation, which cannot be summarised here. The issue for climate policy rests on the fundamental nature of the changes required to economies, both in terms of productive capacity and resource ownership. This poses existential threats to some industries; and the industries and economic interests threatened by change are present and powerful, whereas those who would be favoured by the decarbonisation shift currently have less presence, power and influence. As we will see in our country case studies, the existence of significant reserves or fossil fuels can have a retarding impact on policy development – and not just through the influence on the policy process of those who own or control those reserves, but also because of the electoral voice of those employed in extraction and processing.

Again, the impact of this issue on democracies as opposed to other regime types can be exaggerated. The influence of those who control industries or resources is just as present, if not more so, in authoritarian regimes, and has scope to be more powerfully felt by decision-makers because of the absence of transparency.

Slowness of decision-making

A particular issue which has gained attention in some countries is the extent to which democratic approaches to land use planning decisions can delay implementation of new projects (for example, the requirement for Environmental Impact Assessment on new renewable energy infrastructure, or transport investment aimed in part at lowering carbon emissions). Ensuring adequate consultation of local populations and a wide range of stakeholders, and addressing issues that emerge, can create delay in implementation of projects. However, bureaucratic inertia is also a problem with many authoritarian regimes, and is less responsive to public impatience and pressure to deliver results. Moreover, the long-term nature of the investments needed to address climate change (and conversely, of investments in high-carbon infrastructure which are incompatible with timely emissions reduction) means that mechanisms to ensure that investments are sustainable are vitally important.

1.1.1. Approaches to assessing governance systems

To examine how different types of regime address climate change, we need a typology of regimes. We have relied on the Economist

Intelligence Unit’s categorisation¹³, based initially on its 2020 report “Democracy Index 2020: In Sickness and in Health?”. The report assigns each country to one of four categories: full democracies; flawed democracies; hybrid regimes; and authoritarian regimes. This categorisation is based on scoring each country’s performance across a range of issue, under the broad categories of “Electoral process and pluralism”; “Functioning of government”; “Political participation”; “Political culture”; and “Civil liberties”.

While any assessment of governance is likely to have a measure of subjectivity, the EIU’s approach aims to avoid this as far as possible by building up the scores for each category from a range of questions of a Yes/No type: for example, under “Electoral process and pluralism:

“Are citizens free to form political parties that are independent of the government?

1: Yes.

0.5: There are some restrictions.

0: No.”

And under “civil liberties”:

“Is media coverage robust? Is there open and free discussion of public issues, with a reasonable diversity of opinions?

1: Yes.

0.5: There is formal freedom, but a high degree of conformity of opinion, including through self-censorship or discouragement of minority or marginal views.

0: No.”

The EIU approach is a widely used categorisation of regime types, and this informed our decision to rely on it for our work. Other approaches are, of course, possible. One alternative assessment which provides insight particularly into issues relevant to environmental degradation is the “Atlas of Impunity”¹⁴, produced by the Chicago Council on Global Affairs. This looks beyond democracy issues at imbalances of power, across five broad subject areas: unaccountable governance; abuse of human rights; economic exploitation; conflict and violence; and, critically for our focus of research, environmental degradation. As the authors of the report explain:

“We believe that environmental degradation is a critical part of the Atlas because climate change, resource depletion, and pollution are existential issues that reflect the imbalance of power between polluters/high consumers and those most

13 “Democracy Index 2020: In sickness and in health?”, Economist Intelligence Unit, London 2020. A later 2022 survey is now available.

14 “The Atlas of Impunity”, Chicago Council on Global Affairs, February 2023.

affected by their actions - whether that divide is between high- and low-income countries or between current and future generations.”

...

“A high degree of impunity in this area is typically characterized by a weak record in adopting and implementing environmental treaties; low environmental standards and poor implementation; and a large contribution to negative externalities affecting other countries.”

Assessment of this dimension considers issues such as climate action, air quality, waste management, and the country’s ecological footprint.

At an even more directly relevant level, work has been carried out for the European Commission on assessing environmental governance among EU member states; however, this relies on the high level of legal, policy and governmental similarity among EU member states, and is not easily replicable for different regime types¹⁵.

1.2. Our approach: identifying examples of climate action in practice

This project aims to identify common patterns in how different types of governance system address climate policy; based on this, we then draw lessons about how civil society and other actors can replicate approaches that work, and help to avoid approaches that are counter-productive. Our approach has been to examine practical examples of climate action – or, in some cases, failure of climate policy – in different types of governance system.

To ensure comparability of the evidence found from different countries, a template was developed for country reports (completed versions of the template can be found in the Annex). The template is designed to be useable across a range of governance systems, covering all the types in the Economist Intelligence Unit’s categorisation¹⁶. As an initial step, and as the basis for this report, we chose three examples of what the EIU describes as “flawed democracies”: India, Indonesia, and South Africa.

The template starts with contextual sections, looking first at the governance structure of the country, and then at an overview of its climate policies. It then looks in detail at policy in three areas (transport infrastructure, renewable energy, and energy efficiency in the domestic housing sector), assessing how well policies integrate

15 “Development of an assessment framework on environmental governance in the EU Member States: Final Report, May 2019”; report by the IEEP, Ecologic and Central European University for the European Commission

16 “Democracy Index 2020: In sickness and in health?”

climate considerations, how effective they are, and what factors affect implementation in practice.

1.3. Choosing countries to study

The project does not aim to assess whether democratic regimes are more successful in tackling climate change than others; rather, it aims to identify common aspects to success across different regime types, and develop best practice suggestions for those seeking to promote more effective climate policy across a range of governance systems. In principle, the template can be used for any country and any regime. For this first use, however, we chose regimes in the “flawed democracies” category, with the aim of drawing some lessons about how to improve climate policy performance in a category which covers a significant range of the world’s population, a relatively high level of GHG emissions, and where there is a consensus that there is a significant implementation gap.

The project sponsors, the Konrad Adenauer Stiftung and the European Network of Political Foundations, put out a call for local experts with an understanding of governance and environmental issues, and selected one each for India, Indonesia and South Africa. These experts then completed the template, providing the detailed information on context and performance in each country which can be found in the Annex.

2. Climate policy in the context of governance structures in Indonesia, India and South Africa: common patterns, and country-specific issues

Each of the three countries has environmental rights or duties enshrined in their constitution; South Africa’s in particular is notable for addressing the interests of future generations¹⁷, which should in theory be particularly relevant in promoting action on climate mitigation, where benefits accrue in particular to future generations. India’s constitution imposes a duty on the state to “endeavour to protect and improve” the environment, and on individual citizens to

17 Constitution of the Republic of South Africa (1996), section 24: “Everyone has the right
a. to an environment that is not harmful to their health or well-being; and
b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that
i. prevent pollution and ecological degradation;
ii. promote conservation; and
iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

a somewhat stronger duty to “to protect and improve the natural environment”¹⁸. Indonesia’s constitution states that “Every person shall have the right to live in physical and spiritual prosperity, to have a home and to enjoy a good and healthy environment, and shall have the right to obtain medical care.”

However, in none of the three countries is there a significant body of legal cases testing the constitutional guarantees through the courts. One possible avenue to improving content and implementation of climate mitigation policies could be for **concerned jurists in the three countries to bring forward test cases**, drawing on experience in countries such as the Netherlands, where government has been forced to strengthen climate policy in response to court action brought by young citizens.

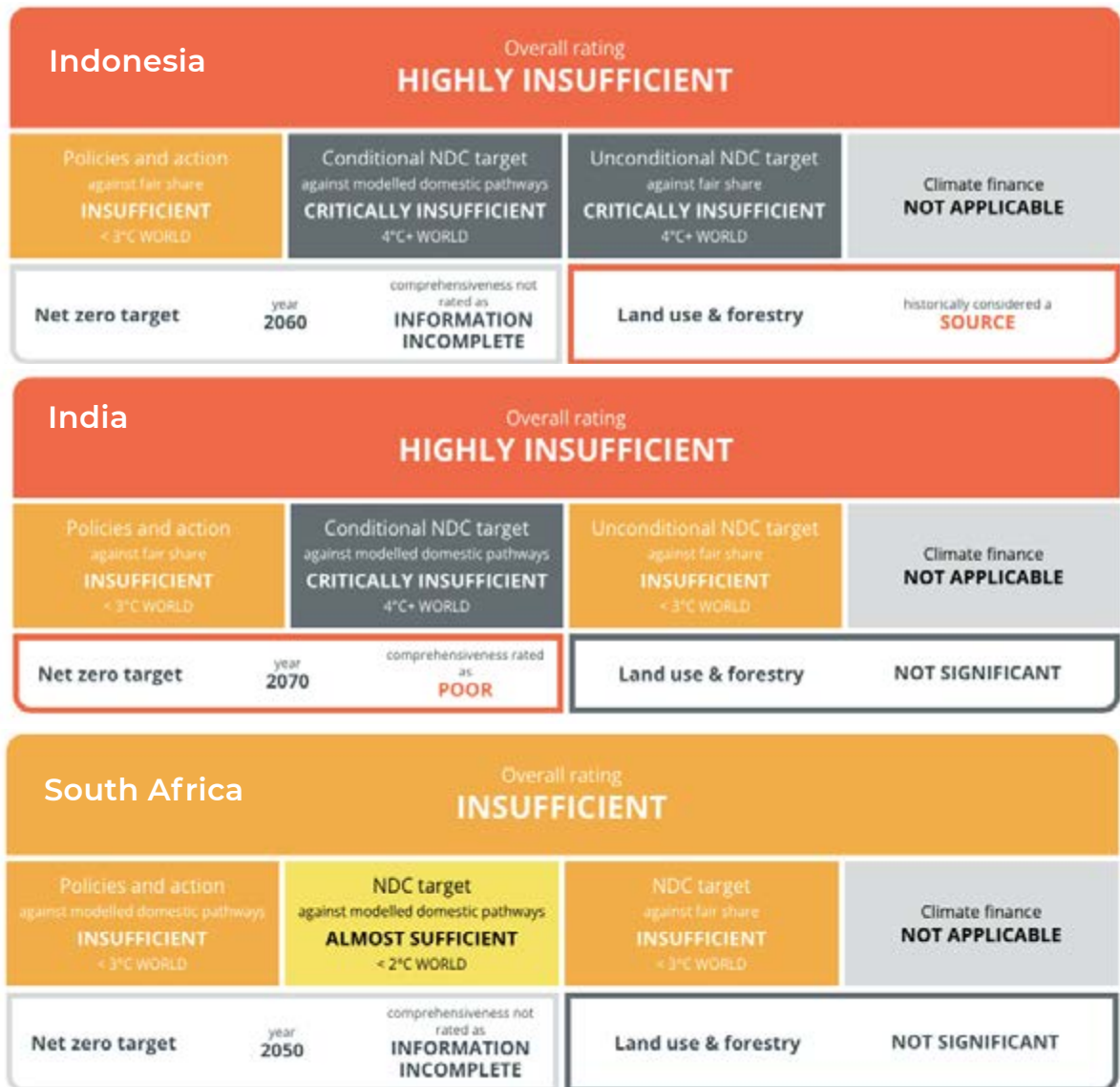
India has an interesting example of potential good practice, in the National Green Tribunal, although the country report notes concerns about a recent acceleration in decision-making, on the grounds that the responsibility for determining fines is being delegated to government officials rather than being decided by the tribunal itself. While the institution does not seem to have been active on climate issues, focusing mainly on local pollution incidents, the existence of such a special tribunal raises the profile of environmental implementation, and gives citizens and NGOs an important additional avenue to secure progress. **Further investigation of this model by other countries is recommended.**

NGO engagement in the policymaking process is evident in all three countries, although the India and South Africa reports are more sanguine about their impact, with the Indonesia report noting that the lack of political salience for environmental issues makes it difficult for them to have a significant impact. One potential approach here is for foundations and diplomatic services active in these countries (particularly those in charge of significant external investment on clean energy) to actively seek out and facilitate environmental NGO involvement in decision-making processes on those investments.

Looking specifically at climate policy, each of our three countries faced criticism for both a low level of stated ambition on climate mitigation in their Nationally Determined Contributions under the Paris Agreement, and a lack of detailed and credible policies to deliver their stated ambitions, as can be seen from Figure 1 below, which shows the assessments made by the “Climate Action Tracker” independent scientific project.

18 Constitution of India, section 48A, section 51A(g).

Figure 1 : Climate Action Tracker assessments



While there is commitment in principle to renewable energy, and (in all three countries) to progressive electrification of the vehicle fleet, there appears to be little attempt to ensure that the profile of emissions is consistent with the objectives of the Paris Agreement. In part, this reflects a lack of political salience to climate as an issue, with voters’ attention focused on economic and, to some extent, immediate local environmental issues. **Efforts to raise the profile of climate policy issues, and to emphasise economic co-benefits for the wider population, should therefore continue to be pursued by and with NGOs.** More significantly, the high level of fossil fuel use for power in all three countries is linked to powerful vested interests, which can slow the implementation of policies aimed at, for example, phasing out of coal (those who own coal plant and mines will seek to maximise the rent from their assets). **Those responsible for development assistance spending on climate issues should continue to press host countries to demonstrate a coherent approach to decarbonisation, focusing not just on attractive clean investments, but also on the urgent**

task of phasing out fossil fuels in ways which are consistent with short- and long-term economic development.

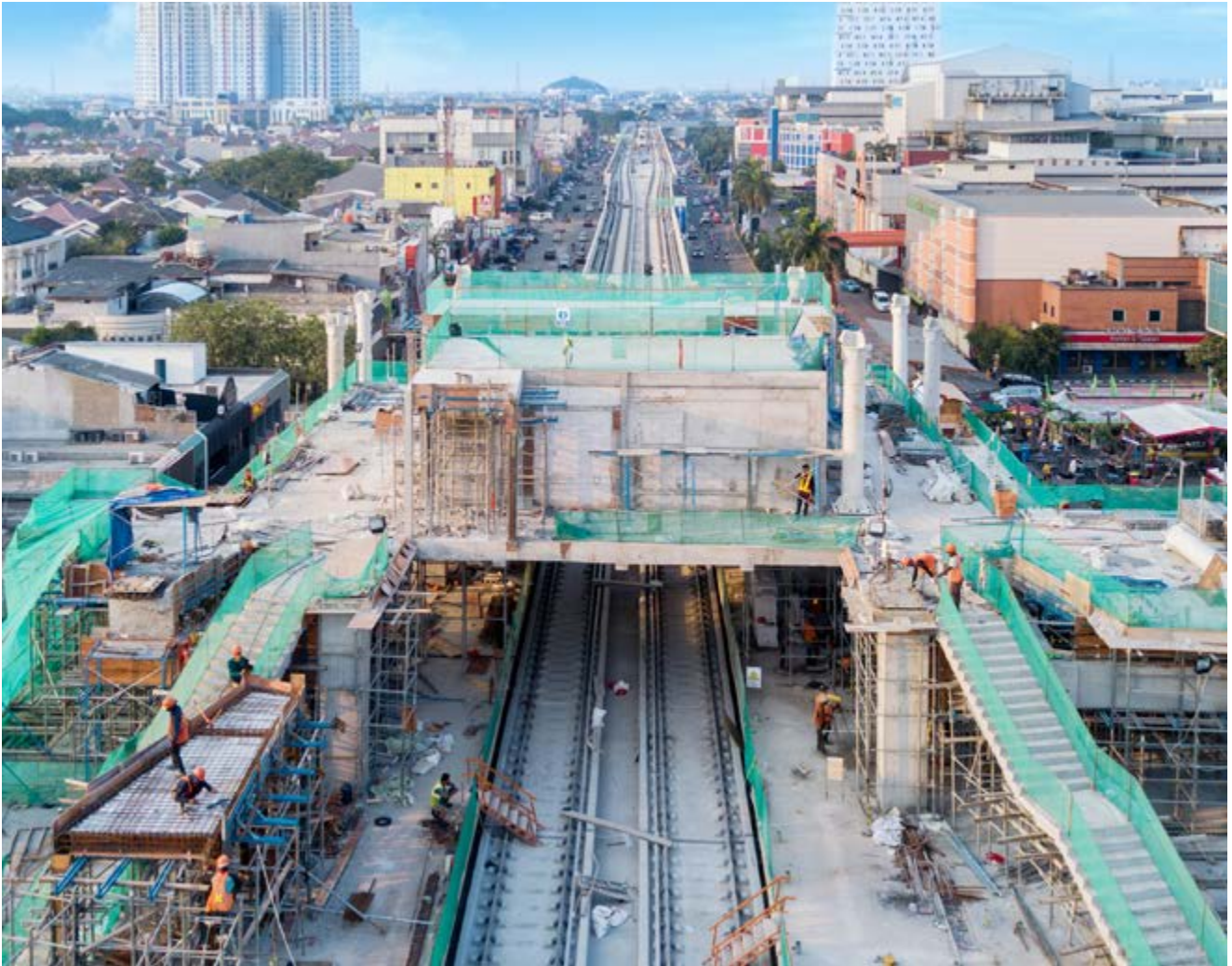
3. Transport infrastructure policy and investment projects

Tackling transport emissions can be a particular challenge for rapidly developing economies, with increasing levels of prosperity correlating with increased travel and private vehicle ownership. The approach taken to transport infrastructure is thus a critical element in successful long-term plans for decarbonisation. Ensuring that national policies for transport are framed in the context of long-term goals for emissions reduction can help to avoid infrastructure decisions which reduce future mitigation options.

While **India** and **South Africa** have to some extent set out long-term approaches to transport emissions, **Indonesia’s** policies have focused significantly on road construction, a key plank of President Jokowi’s electoral mandate. And while an effective Environmental Impact Assessment (EIA) process could be a mechanism for testing whether transport projects, particularly road-building, can be made compatible with long-term GHG emissions objectives (as well as with air quality and other local environment priorities), there are significant weaknesses in the EIA process in all three countries.

In **Indonesia**, the requirement for an EIA has been effectively scrapped, following the prioritisation of major road-building projects under the 2020 “Job Creation Law”; it is now only necessary in cases where the project is classified as “high risk”; but the definition of “high risk” is unclear, and classification is in the hands of the government. In **South Africa**, an EIA is required for major infrastructure projects including road-building and the GauTrain rapid transit which is used as a case study in the country report; however, climate emissions impacts are not a significant element in the EIA, which focuses instead on local environmental impacts. In **India**, an EIA is also required, although there are weaknesses in the rigour with which the requirement is enforced, and the quality of the resulting EIA reports.

While there is potential for delay over the production of an EIA (a factor which presumably underlies the Indonesian approach of avoiding them altogether), these can be overcome if a greater clarity is provided on the objectives of the mechanism and the types of impact which should be prioritised. If properly used an EIA could be an effective tool to avoid investments which are incompatible with a country’s long-term emissions trajectory, to identify potential trade-offs in decarbonisation investments and facilitate better decision-making. **Climate policy advocates could usefully put effort into ensuring that EIAs for individual projects, and the EIA laws in each country, put enough**



emphasis on accurate assessment of GHG emissions impacts, both in the short-term and in the longer-term, and compatibility with the emissions trajectory implied by NDCs and by the objectives of the Paris Agreement.

In all three countries, economic and job creation benefits, the reduction in travel times, and to some extent, local air pollution benefits are significantly more important political drivers for transport investment than climate mitigation; the more immediate concerns of the populations affected trump the medium- to longer-term benefits of reductions in GHG emissions. However, the urban transport infrastructure investments highlighted in each country – the GauTrain in South Africa, the Mumbai Metro in India, and the Jakarta MRT in Indonesia – show significant potential to reduce emissions. There is thus some potential to use clean air and economic co-benefits to increase attention on, and public support for, decarbonisation.

Finally, all three countries have focused to some extent on encouraging uptake of electric vehicles (EVs). While this needs to go hand-in-hand with decarbonisation of electricity generation in order to deliver significant emissions reductions, it can be an important element in wider decarbonisation policy, as well as having significant local air

quality benefits. Indonesia appears to be further advanced in linking incentives for EV purchase with the encouragement of domestic production – a gap which has been identified in South Africa’s approach until recently. However, there is also greater reluctance in Indonesia to ensure that fuel prices reflect emissions, with no progress yet on phasing out existing subsidies, let alone introducing taxation to reflect environmental externalities. While progress on EV roll-out is welcome, **climate policy advocates could press governments to develop policies aimed at maximising the emissions impact of these policies**, including through effective fossil fuel pricing, and through mapping how a future decarbonised transport sector fits within longer-term limits on emissions.

4. Renewable energy policy and investment projects

The pattern observed in transport investments – of some low-carbon policies and investments, but without a clear plan for ensuring that there is sufficient investment to meet long-term emissions trajectories – is also visible in the renewable energy sector. All three economies feature significant vested interests in fossil fuels, with India and Indonesia ranked second and third in the world for total coal production; South Africa is ranked seventh, but in terms of coal production per capita is second (behind only Australia), with a level ten times higher than that of India. This situation in all three countries creates significant inertia in the development of plans and policies to phase out fossil fuels. **In all three countries, a greater focus by climate policy advocates on highlighting these conflicts**, and drawing attention to potential or (as in the case of Indonesia) clear conflicts of interest among decision-makers **should be encouraged**.

Political commitment to development of renewables is reported as lacking in **South Africa**; while **India** has some clear targets, but appears to face challenges in making full use of installed capacity, suggesting further investment in the electricity grid may be needed; and **Indonesia’s** renewable energy plans show a clear mismatch with the need to phase out coal-generated electricity, and even with its current relatively unambitious NDC emissions targets. One of the drivers in all three cases may be the misalignment of incentives for decision-makers; there are few rewards for tackling the vested interests in coal and other fossil fuels. A possible approach to dealing with the political challenge of a radical decarbonisation of energy supply could be to **identify opportunities for development of low-carbon technologies in coal-producing areas**, with a view to providing “just transition” opportunities for those currently employed in extractive industries.

The case studies provide some positive examples of individual projects: in India, the creation of the largest solar energy park (Badhla, in the

state of Rajasthan), and the Rewa Ultra Mega Solar Power Project, with the help of the solar park programme of tax breaks, land concessions, and other incentives, provide clear success stories; in South Africa, the Redstone Concentrated Solar Plant Project is running to time and appears to have strong local support. **Lessons from successful investments should be shared widely, to encourage replication.**

Differing approaches have been adopted to the use of EIA for renewable investment; in India, most renewable energy projects do not require an EIA, an approach which may lead to environmental problems not being identified in future investments, which risks losing support for the scale of investment required. In South Africa, an EIA is required; and in Indonesia, EIA requirements for renewable energy investments have been reduced under the Job Creation Law referred to above in respect of roadbuilding. **In all three countries, guidance on the cumulative level of renewable energy investment required to meet long-term emissions goals would help in ensuring coherent decision-making.**

Finally, in **India** and **South Africa** some difficulties are reported in governmental coherence – for example: differences in emphasis between national and state level governments; delays in renewable investment in India due to tariff policies favouring local production of solar cells; and poor uptake in India of a scheme to encourage farmers to install solar power because of a failure to ensure adequate levels of co-financing from farms. Where delays are caused by differences between national and state level governments, the use of mechanisms such as India’s “nodal agencies” – public bodies appointed by national and state level governments – could be considered. A key challenge in addressing all of these issues, however, is the underlying problem of ensuring that climate mitigation is a sufficiently high political priority that governmental failures receive public attention and censure, and government successes are applauded.

5. Energy efficiency policy

The final area of practice we asked the country reports to look at was energy efficiency/ energy supply in the residential sector. Here there was a marked difference in the political salience of the issue between **India** and **South Africa**, on the one hand, where residential energy supply is a major focus of government policy, and **Indonesia**, where there is significantly less attention, presumably because of a significantly lower level of off-grid settlements and homes.

In both **India** and **South Africa**, there are a range of government programmes aimed at electrification, improvement of the supply of clean fuel for cooking, and energy efficiency. These programmes have had a significant impact on poverty levels; and in some cases have also helped to reduce emissions (both of greenhouse gases and of local air pollutants, especially particulates).

Effort has also been focused in both countries on improving public awareness of energy efficiency. In **India**, public awareness of energy efficiency products increased from 33% in 2010 to 63% in 2014, apparently in response to government awareness and labelling campaigns. There is less evidence available from **South Africa** on policy impacts; and a persistent problem of coal use in response to unaffordable electricity prices in some areas, notwithstanding the use of social tariffs to favour poorer households.

The climate mitigation benefits of energy efficiency policies tend not to be emphasised in their development and implementation: social and economic benefits are more relevant, and the immediate challenges faced by poorer households trump the longer-term issue of climate change. However, there is scope in both **India** and **South Africa** to consider approaches which (i) **use the popularity and direct relevance of energy efficiency and energy connection issues to raise public awareness of the climate issue;** (ii) **link measures to tackle energy poverty with renewable energy investments, with (for example) encouragement for small-scale village solar investments;** and (iii) **ensure that a realistic assessment of the potential impact of both electricity connection and energy efficiency policies is integrated into long-term planning for decarbonisation and renewable energy,** with consideration given to whether to accelerate energy efficiency policies in order to enable a more rapid transition to cleaner energy.

The challenge in **Indonesia** is different: raising the profile of energy efficiency issues is a necessary first step in ensuring better household awareness and uptake of simple and cost-effective measures. It will be interesting to see if the impact of recent global increases in energy prices have had an effect on awareness.

6. What are the problems in flawed democracies, and what approaches work? What are the practical lessons for climate actors in these and similar countries?

This report has tried to set out possible approaches that the advocates of climate action could adopt in the policy areas we have considered. Some common issues have emerged across the three countries studied, and, while we need to be careful about assuming that what will work in one government culture and economic context will work in another, some ideas worth trying can be identified.

The key challenge in all three countries is the lack of political salience



of the climate issue. While, as noted above in the discussion on advisory bodies and citizens assemblies in some countries, the need is sometimes felt to take the politics out of climate change, in our study countries there is an urgent need to get climate change into politics. Political relevance may change as negative impacts from climate change are increasingly felt, although this will not necessarily create a focus on mitigation measures (as opposed to the equally urgent challenge of adaptation). Approaches which can be deployed include:

- Identifying and publicising co-benefits of climate mitigation policies, including in terms of health benefits, and reduction in fuel poverty;
- Assessing whether constitutional provisions on environmental rights could be used to bring cases to accelerate mitigation policies (and, perhaps, assessing whether India’s Green Tribunal system could be used to address climate issues, and whether it could be replicated successfully elsewhere).

The impact of vested interests in fossil fuels and polluting industries is present in all three countries to a varying degree (nor is it unique to the “flawed democracies”, as the results of the “Atlas of Impunity”¹⁹ project referred to above make clear). Action to address this problem would have broader benefits, but is not straightforward. Climate activists could look for opportunities to highlight links between political financing, fossil fuels, and pollution. And climate policy advocates could focus attention on the need for “just transition” policies, where supporting measures are put in place to address the interests of those currently employed in extraction and other fossil fuel industries, and ensure that they can see positive outcomes from decarbonisation.

Finally, all three countries suffer from a degree of incoherence in climate policy (again, by no means a problem exclusive to the “flawed democracy” group of countries). In particular, efforts to promote clean transport and renewables infrastructure are present in each country, but no attention appears to be given to whether they are deployed at a level adequate to achieve the objectives of current NDCs, let alone the steeper emissions reduction trajectories necessary to deliver the objectives of the Paris Agreement. The establishment of public advisory bodies has been useful in addressing this challenge in other countries: here it would come up against two separate problems of political salience. Firstly, there would be a lack of political will to set up such bodies; and secondly, there would be little public attention to their recommendations even if they are established. One approach, in advance of achieving greater political salience for climate policy, is to work with multilateral international investors – for example, the countries cooperating in the Just Energy Transition Partnership in Indonesia, or the similar funding available to South Africa – to identify such coherence gaps, and put pressure on Governments to develop policies and plans to meet them.

19 “The Atlas of Impunity”, Chicago Council on Global Affairs, February 2023.

The other problem of coherence present in all three countries is the regionalisation of some policy responsibilities relevant to climate mitigation, and the challenge of ensuring progress when there are political differences between national and state/regional level regimes. This is to a large extent a problem of democratic politics, and can only be solved through the operation of the political process. Drawing public attention to failures on the part of either national or state level governments to cooperate may help to some extent; although doing so in ways which ensure that the political incentives point towards enhanced cooperation is not likely to be straightforward.

The recommendations made in this report are offered tentatively; all three countries are democracies, and solutions to shortcomings in climate policy need to be developed through the democratic political process in each. Commentators from other countries have limited legitimacy in that process. However, cooperation by climate activists across different regimes of a similar type is important: efforts to share experience of what works, and what doesn't, and to pool intellectual resources, should be deepened.

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Annex: Country reports

Country template

Assessment of governance and climate action

Indonesia

Prepared by: Noory Okthariza, Nadya Daulay
June 2023

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Glossary of terms

Term	Description
Peraturan Presiden	Presidential regulation; 5 th highest regulation in the hierarchy of Indonesian law
Undang-undang	Law; 3 rd highest regulation in the hierarchy of Indonesian law

List of abbreviations

AMDAL	Analisis Mengenai Dampak Lingkungan (Environmental impact assesment)
BAU	Business as usual
BPTJ	Badan Pengelola Transportasi Jabodetabek (Jakarta Transportation Management) Agency
BRT	Bus rapid transit
BUR	Biennial Update Report
CIP	Comprehensive Investment Plan
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CSIS	Centre for Strategic and International Studies
CSO	Civil society organization
EECCHI	Efficiency Conservation Clearing House Indonesia
ESDM	Kementerian Energi dan Sumber Daya Mineral (Ministry of Energy and Mineral Resources)
EU	European Union
EV	Electric vehicle
FOLU	Forestry and other land uses
GDP	Gross domestic product
GHG	Greenhouse gases
GW	Gigawatt
GWh	Gigawatt hours
IESR	Institute for Essential Services Reform
IGA	Investment Grade Audits
JETP	Just Energy Transition Partnership
JICA	Japan International Cooperation Agency
KLHK	Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment and Forestry)
Kemenhub	Kementerian Perhubungan (Ministry of Transportation)
KPK	Komisi Pemberantasan Korupsi (Corruption Eradication Comission)
LCCP	Low Carbon Compatible with Paris Agreement
LRT	Light rail transit
LTS-LCCR	Long-Term Strategy for Low Carbon and Climate Resilience
Mha	Million hectares
MoU	Memorandum of Understanding
MRT	Mass rapid transit
MTI	Masyarakat Transportasi Indonesia (Indonesian Transportation Society)
MTon	Metric ton
MW	Megawatt
NDC	Nationally determined contribution
NGO	Non-governmental organization
NZE	Net zero emissions
PLN	Perusahaan Listrik Negara (National Electricity Company)
PV	Photovoltaic
REDD+	Reducing Emissions from Deforestation and Forest Degradatoin
RPJMN	Rencana Pembangunan Jangka Menengah Nasional (National Medium-Term Development Plan)
RSP0	Roundtable on Sustainable Palm Oil
RUEN	Rencana Umum Energi Nasional (National Energy Plan)
TKDN	Tingkat komponen dalam negeri (Local content requirement)
TOE	Ton of oil equivalent
UK	United Kingdom
UN	United Nations
UNFCCC	The United Nations Framework Convention on Climate Change
US	United States
USD	United States Dollar

1. Context and characteristics of national governance

Indonesia has been commended as one of the most improved countries among the democratizers in Southeast Asia.²⁰ Shortly after the fall of the authoritarian regime led by President Suharto in 1998, the country established many of its new institutional setups. The key laws in ensuring democratic standards, such as upholding human rights and freedom of the press, were formally adopted in 1999. In the same year, the long-serving centralized political structure was radically transformed into a decentralized system through which local policy can now exercise more power. To eradicate ingrained corruption, the anti-corruption agency (KPK) was established, and was initially popular (although its independence has been curtailed in recent years). And equally importantly, regular free and fair elections have been held once every five years, with peaceful transfer of powers since 1999.

Zooming in on the recent political development and governance practices, however, leads to a less favourable assessment. Indonesia seems to be converging with a group of countries that experience a slowing, perceptible decline in their democratic quality. The 2022 Economist Intelligence Unit report maintained Indonesia’s status as a ‘flawed democracy’ and ranked the world’s largest Muslim population in 54th place out of 167 countries. This positioned Indonesia well below Southeast Asian neighbors such as Malaysia, East Timor, and the Philippines. Updated scholarly literature on Indonesian politics also points to a deterioration of democratic practices, including disturbing trends such as religious polarization, the rise of populism, conservatism, and anti-reformist elites among the key drivers.²¹ On the corruption front, the report from the 2022 Transparency International ranked Indonesia at 110 out of 180 countries with its corruption index dropping 4 points compared to the previous year, the worst decline since 1995.

These declining democratic conditions should not be considered an outright failure of democratic governance. Indonesia at least continues to uphold competitive electoral politics, and political rivalry remains viable in both the national and local arena. Nonetheless, this seemingly open political space may not necessarily lead to enhanced public policy, particularly in relation to Indonesia’s general environmental framework. This is in part because stronger regional power reduces the coherence of policy, and leads to a complicated policymaking environment, with various levels of government and overlapping responsibilities. This can create challenges in coordinating action and in ensuring consistent implementation of climate policies across different sectors and regions.

For the most part, this is also because the current narrow focus and

20 Okthariza (2023, p. 102).

21 Power & Warburton (2020), Aspinall *et al.* (2020), and Mietzner (2012)

governance approach of the sitting President Joko ‘Jokowi’ Widodo (2014–2024) may not always be consistent with environmental ideals. Some have cast doubts over whether Indonesia can navigate the conflict between its national climate strategy and its ambitious developmental plans, especially when climate protection has been narrowly framed as a forestry and land-use issue.²²

President Jokowi has been known for his no-nonsense yet populist approaches when it comes to developmental programs. His electoral credibility was built around his success in building massive infrastructure projects such as the trans-Java and Sumatera toll roads, seaports, airports, high-speed railways, and power plants. His most ambitious plan is to build the new capital ‘Nusantara’ which will replace the sinking and overcrowded capital Jakarta with a new city in East Kalimantan on the forest-rich island of Borneo. This plan raised fears not only about potential deforestation but also over-reliance on the coal-rich power plants which Borneo is known for. These concerns are reinforced by the fact that the country’s economic engine has long been heavily driven by fossil fuel-based energy, making a sudden shift to clean energy now both politically unrealistic but also more costly than an earlier clean energy shift would have been.

In this context implementation of Indonesia’s main environmental policy instrument, Law 32/2009 on Environmental Protection, has never been easy. Although Indonesia has not ratified international commitments on environmental governance such as the Aarhus Convention and the Escazú Agreement, the Law is no less comprehensive in ensuring justice rights apply to environmental issues. For instance, Article 65 section 2 says *“Everyone shall have the right to environmental education, access to information, access to participation and access to justice in fulfilling the right to a good and healthy environment”*. Additionally, the Law grants citizens legal protection by stating that *“everyone who fights for the right to a good and healthy environment shall not be prosecuted based on criminal and civil lawsuits”* (article 66).

However, the enforcement of the Environmental Protection Law has come under question ever since the government issued the new policy called ‘Omnibus Law’ on Job Creation in 2020. This Law was highly controversial, not only because it was not based on open public consultation and engagement, but also since many of its provisions are problematic from an environmental standpoint. The Job Creation Law was Jokowi’s response to the slow-moving bureaucratic provisions for business permits and basic investment setup. The Law bypasses many impediments – from the business point of view – in carrying out economic activities. Chief among these is that private company now enjoys a less rigorous requirement for AMDAL (the environmental impact assessment). In addition, civil society now has less involvement in evaluating potential environmental impacts. This is because the definition of ‘public involvement’ under the Job Creation Law has been

22 Ordóñez *et al.* (2021). Coal, power and coal-powered politics in Indonesia.

narrowed, accounting only for those who are directly affected by the company's activities.

Whether or not this trend persists will largely depend on the result of the presidential election, scheduled on February 2024. Of the three main contenders, Ganjar Pranowo, Prabowo Subianto, and Anies Baswedan, the first two names are closely associated with President Jokowi. Anies Baswedan might be the most eloquent candidate when it comes to environmental issues. But under his leadership as Governor of Jakarta (2017-2022), the air quality index of the city was among the worst in the world.²³ As of now, it is hard to predict who will likely be Jokowi's successor given the vote margins between the three are very slim. But Indonesia's future climate measures may be in trouble if none of the candidates take this issue seriously.

2. National climate policymaking

Indonesia updated its Paris Agreement targets in 2022. In the latest climate plan, known as the enhanced Nationally Determined Contribution (NDC), Indonesia only slightly changed its greenhouse gas targets from the initial NDC, that is, from 29% to 32% below its business-as-usual scenario, and from 41% to 43% conditional on sufficient international financial and technological support. The statement released from the Ministry of Environment and Forestry (KLHK), which acts as the focal point for the UNFCCC, said that the new targets were the result of various developments made in environmental and energy sectors such as the creation of a new policy called FOLU Net-sink 2030, accelerated use of electric vehicles, and expansion of the B-40 biofuel program.

Critics say the plan is too weak to meet the 1.5C climate target. *The Climate Action Tracker* rates Indonesia's effort as 'highly insufficient', given the country will likely overachieve the targets by 23-38% with policies currently in place. The document also provides no detail as to phasing out Indonesia's reliance on coal-based energy. As Indonesia's biggest commodity for export, coal is very critical since it supplies around 60% of the country's electricity power. It remains the biggest source of Indonesia's emissions, accounting for nearly 50% of the total 619 Mton CO₂e in 2021, far exceeding oil (34%) and gas (12%).

The more specific action plans are laid out in the Long-Term Strategy for Low Carbon and Climate Resilience 2050 (LTS-LCCR 2050) issued by the KLHK. This document aims to provide policy direction and policy alignment at both national and subnational levels whilst, at the same time, unlocking opportunities for innovation and adjusting to global dynamics. It indicates that Indonesia's national climate strategy will primarily rest on three key sectors: forestry and land use, energy, and waste management. Forestry and land use, together with energy, are

23 Independent Observer. (2022). “Jakarta second most polluted city in the world, says IQAir.”

the main contributors to the NDC target, accounting between them for 97% of emissions reductions.²⁴

Indonesia envisions that it will reach a net sink in forestry and land-use emissions by 2030. This target depends primarily on:

- 1) the success of reducing emissions from deforestation and peatland;
- 2) delivering forest, peatland, and mangrove restoration,
- 3) performing sustainable forest management; and
- 4) maximizing unproductive/idle land for forest and agricultural plantations.

A road map has been developed for implementing these strategies through the newly revamped REDD+ National Strategy 2021-2030.²⁵ With a forest area of about 64 percent of the national land territory, and its ability to absorb and store carbon pools, forestry will play a crucial role in both mitigation and adaptation strategies.

In the energy sector, the country's main pillars will largely depend on:

- 1) energy efficiency measures;
- 2) substitution of fossil fuel by renewables in power generation and transport; and
- 3) electrification of end-use in building and transportation.

Assuming the best LCCP scenario, there will be a notable decline in emissions after 2030, from 1,030 Mton CO₂e to approximately 572 Mton CO₂e by 2050. This may not be in line with the net zero emission (NZE) projection in 2050 by advanced economies.²⁶ The LTS-LCCR report states that this trajectory takes into account past development and future projections in Indonesia's energy consumption and energy supply, GDP and population growth, and change in the transportation system.

The progress made in the forestry and land-use sector may give some cause for optimism. Despite its extensive land cover area, Indonesia has not experienced major haze-causing fires for three years in a row (2020-2022) and was not among the biggest emitters in global fire emissions.²⁷ In addition, in stark contrast to several other countries that produced higher emissions in 2021 than in 2019, Indonesia also emitted less compared to before the pandemic.²⁸ Stronger enforcement in the forestry sector has caused a significant drop in the deforestation rate. According to the government, in 2020, the level of deforestation fell by 75%, to the lowest level since monitoring began in 1990.²⁹

One area of concern is the ongoing development of Indonesia's palm

24 Kementerian Lingkungan Hidup dan Kehutanan. (2022). Indonesia REDD+ National Strategy 2021 - 2030, pg. 1

25 *Ibid.*

26 IEA. (2021). Phasing Out Unabated Coal: Current Status and Three Case Studies.

27 Foresthins. (2022). “Third year of no substantial fires in Indonesia, serious threats lie ahead.”

28 The European Commission. (2022). JRC Science for Policy Report: CO₂ emissions of all world countries.

29 Jong, Hans Nicholas. (2021). “Deforestation in Indonesia hits record low, but experts fear a rebound.”

oil industry. In 2021, the size of palm oil plantations was around 14.6 Mha or roughly 12 percent of the total forest area.³⁰ This is roughly equivalent to that the area of peatlands, which cover an area of 14.9 Mha. Continuing domestic and external demand suggest that there is potential for further extension of palm oil plantations. It would take a major structural effort to overhaul this industry because the country has long enjoyed its status as the largest producer of this commodity, supplying more than half of global palm oil supplies. Adding to this problem, only around 2.31 Mha (16%) of palm oil plantations were certified as sustainable by the RSPO in 2021.

Compared to forestry and land use, the prospects for mitigation in the energy sector are even more concerning. The path towards decarbonization in the energy sector is slower and indicates Indonesia’s strong attachment to fossil fuel energy. The updated NDC lays out plans for energy diversification that are modest, if not poor, in extent. The use of renewable energy will be at least 23% in 2025 and increase only to 31% percent in 2050; oil would be less than 25% in 2025 and less than 20% in 2050; and coal should be a minimum 30% in 2025 and minimum 25% in 2050. In particular for coal, this rate contradicts the recommendation from the UN’s climate science body that calls for a complete phase-out of coal by 2040. While the global use of coal for electricity must also fall by 80% below the 2010 level by 2030, Indonesia’s coal projections continue to increase until 2027, and would represent around 64 percent of electricity generation in 2030 under the current measures.

The good news is that both Indonesia’s updated NDC and LTS-LCCR documents were developed before the creation of the newly formed international initiative for Indonesia’s energy sector named JETP (Just Energy Transition Partnership).³¹ The secretariat of JETP has been established within the Ministry of Energy and Mineral Resources (ESDM) in February 2023. The JETP was the output of the G-20 Leaders’ Summit held in Bali last year, where Indonesia and several advanced countries, co-led by the United States and Japan, including Canada, Denmark, the European Union, France, Germany, Italy, Norway, and the United Kingdom formed a partnership to boost and speed up Indonesia’s target toward emissions reduction. It is pledged that the JETP secretariat will coordinate the mobilization and deployment of an initial \$20 billion in public and private financing within the next three to five-year timeframe.

The short-term goal for the secretariat is to devise a new policy plan for the energy sector within the next month. The final action plans regarding coal phase-out and strategies to accelerate the use of renewable energy will be most awaited; therefore, it is highly likely that Indonesia will revise its NDC again and provide more comprehensive

30 Statista. (2023). “Size of oil palm plantations Indonesia 2012 – 2021.”

31 Ministry of Finance Japan. (2023). Launch of the Just Energy Transition Partnership Secretariat in Indonesia.

policy plans on energy so that it fits with this new development.

The last issue of concern is the level of political support for tackling the climate issue. It is safe to say that environment has not become an important political and policy debate. As the 2024 election is approaching and some potential successors of President Jokowi have been gaining ground, candidates have yet to address the issue seriously in their campaigns. The role of political parties in raising policy issues is also minimal as parties tend to be formed and run based on the personality of their leaders rather than ideological or policy platforms. Furthermore, a ‘green party or ‘green politics’ has never been present in Indonesia. The *Centre for Strategic and International Studies* (CSIS) survey in 2019 indicated that only 1.6% of respondents deemed environmental issues as important, much lower than other issues such as the price of staple foods (23%), poverty (19%), and job creation (14%). The often discordant regulatory regimes and institutions at both national and local levels may also put Indonesia’s climate actions into menace.

This is not to say that Indonesia’s future is bleak for climate issues. The relatively rapid adoption of electric vehicles for both private and public transport in the last two years, alongside its policy incentives, might boost the awareness of climate measures among Indonesians, especially young people. The problem is that this measure is mostly felt in major cities such as Jakarta, and will take more years to have an impact in smaller cities.

3. Sectoral information

We break down the national climate policymaking into three sectors: transport infrastructure, renewable energy, and energy efficiency. More assessment will be given to the first two sectors. We will examine each sector according to the main policy document released and evaluate them according to Indonesia’s climate policy targets as stated in the enhanced NDC and LTS-LCCR. Recent relevant developments within each sector will also be examined along with potential notable challenges. Additionally, given forestry and land-use sectors are among one of the key pillars in Indonesia’s emissions reduction effort, we will recap important development in this sector at the end of the report. This report closes with a summary where we reiterate several key points on each sector and how Indonesia’s political and governance structure affects its climate responses.

3.1 Transport infrastructure

The World Bank data indicated that Indonesia’s 2019 emissions per capita are lowered compared to East Asia and Pacific and all countries combined – 2.3 versus 6.5 and 4.4 metric tons per capita, respectively. However, Indonesia has been slow to adopt policies on transport infrastructure. This is partly due to a lower level of investment in transport co-financed with the private sector than both middle-income



and lower-middle-income countries. Indonesia's investment in this sector stands at \$6.74 billion compared to \$42.47 and \$17.51 billion for the other income brackets in 2021.³² The current proportion of transport investment relative to GDP is sharply lower than before the Asian financial crisis 1997-1998, standing at 3.5% of GDP now versus 8% GDP then.

Insufficient funding for transportation infrastructure leads to increased regional inequality, ineffective delivery of transportation services, and high costs that hinder the economy from reaching its full potential. Under the leadership of President Jokowi, the government aims to reverse this condition by issuing two RPJMN (a medium-term developmental plan) to boost transport infrastructure from 2015 to 2019 (Jokowi's first term) and from 2020 to 2024 (Jokowi's second term). In the first RPJMN, Indonesia aims to build 2650 km of new roads and 1000 km of toll roads, 15 new airports, 24 seaports, and 29 BRT. In the second RPJMN, the figures added 3000 km of new national roads, 2500 km of toll roads, and the development of the first Southeast Asian high-speed railway that will connect Jakarta – Bandung.

Toll road development is the area that has had the most public attention and on which President Jokowi earned most of his electoral appraisal. It is reported that up to 2022, Indonesia built around 1900

32 World Bank. (2023). Investment in transport with private participation (current US\$) – Indonesia.

km of new highways within 8 years, a major growth compared to only 780 km that were built from 1973-2014. The toll roads have successfully connected all provinces in Java and will connect all provinces across Sumatera Island shortly. Its achievement level may be below par as of now, in part because substantial amounts of public expenditure were reallocated during the pandemic. Moreover, the land clearing issue has become one of the main challenges of Indonesia’s infrastructure development. Competing claims on land ownership can take years to be resolved, given that several land claimants might challenge and appeal the government’s decision to the court. Unfortunately, devolution of power to the regional level has meant that bureaucratic problems and mismanagement of local polity often hinder timely implementation of projects.

As far as the environmental impact assessment (AMDAL) is concerned, each private company or state-owned enterprise responsible for major development projects used to be required to submit such a document. However, changes made since the implementation of Jokowi’s signature policy in 2020, the Job Creation Law, mean that an environmental assessment is required only for any enterprise classified as ‘high-risk’ that would have potential environmental impacts. The specific criteria for the ‘high-risk’ business are not set out in the Law, so the requirement for an environmental assessment is much less stringent than before. Before the Job Creation Law, the environmental license had to be approved first to get the business license; thus, AMDAL was a crucial document for getting the environmental license. However, after the new Law is in place, this process was simplified; environmental and business licenses are now integrated and their applications can be submitted concurrently. The government argued that this reflected the need to shorten the time required for business permits and simplify bureaucratic requirements.

In terms of types of vehicles, most Indonesians rely on two-wheelers transport, accounting for 84.5% of 136 million registered motor vehicles. The transportation sector was responsible for emitting 157.8 MtCO₂e in 2019,³³ making it the third largest within the energy area after the electricity and heat and industrial sector. The 2020 report from Climate Transparency indicated that transport emissions are projected to increase by 53 percent above 2015 levels by 2030, and will almost double from 2030 to 2050. The final energy consumption of the transport sector is 33% of which 86% of which comes from oil and only 14% from biofuels in 2021.

Starting in early 2023, Indonesia has aggressively pursued a new policy on electric vehicles (EVs). Knowing its market share of new car sales in EVs is minuscule (0.02% in 2021),³⁴ the government decided to subsidize the new purchase of electric cars that meet at least 40%

33 Mahalana *et al.* (2022). Policy Brief: A Path to Zero-Emission Vehicles and Greener Infrastructure Development in Indonesia.

34 Climate Transparency. (2022). Climate Transparency Report: Comparing G20 Climate Action, Indonesia.

TKDN (domestic component level). Two cars fit with this requirement, Hyundai Ioniq 5 and Wuling Air, each will receive roughly \$4500 to \$5400 and \$1700 to \$2400 in price reduction. Furthermore, the government will also subsidize the new purchase of EV scooters to the amount of \$470 each. The same aid will apply to those wanting to convert fuel-based scooters into EVs. In total, the government plans to allocate public funds to 200.000 scooters and 35.900 cars until the end of this year. Alongside this policy, the annual EV tax rate is significantly less than conventional vehicles, with EV owners paying only a maximum 30% of the basic tax.

Speeding up the development and interconnection of urban transport remains one of the key challenges. Jakarta, the most polluted and congested city in Indonesia, is struggling to catch up with its long-overdue development of urban transport. The head of the Jakarta Transportation Management Agency (BPTJ) stated that the potential economic loss because of congestion and poor public transportation system reached Rp 71.4 trillion or nearly 5 USD billion per year³⁵, not to mention the opportunity loss in terms of job productivity, poor air quality, and waste of fuel per day. The weak civil society engagement in this sector might explain the delay in progress. The only apparent CSO, the Indonesian Transportation Society (MTI), does not act independently and is closely associated with many government agencies. Many of MTI's key personnel were high-profile officials from various transportation regulatory bodies, such things as ‘civil alliances’ on public transport remain non-existent. As a result, the approach made in this sector is highly bureaucratic and progress largely hinges on the ability and commitment of government institutions.

Two notable steps forward in urban transport; are the development of Mass Rapid Transit (MRT) and Light Rail Transit (LRT), all located in Jakarta and its surroundings. The Jakarta MRT is the long-term urban project funded by JICA that will connect the south-north and east-west parts of Greater Jakarta. Its funding was agreed upon way back in 2008, but only began its construction in 2013 after the new governor was elected – a testimony to how politics can be intrusive on a large-scale infrastructure policy. Four phases of development are planned. The first phase (stretching for 15.7 km), connecting the south to the central area, has been operating since 2019. The second phase, which will fully connect south to north is still under construction and will be operating fully in 2029. The schedule for the third and fourth phases is to be determined. The total length of MRT is 159.7 km and will play a key role in transforming the urban transportation system.

After numerous delays, the first phase of LRT is scheduled to commercially operate in August 2023. The first phase has two lines, stretching for 44.5 km, and will connect central Jakarta with the adjacent areas in West Java (Cibubur, Depok, and Bekasi). The second

35 VOI. (2021). “Traffic Jams in 6 Big Cities in Indonesia Cause Losses of 71.4 Trillion, 2.2 Million Liters of Fuel ‘evaporates’ Per Day.”

phase is in the planning stage and will extend both lines southwards.

These two major urban means of transport are integrated into the already established Transjakarta BRT. This bus system is the world’s longest BRT with 251 km in length, operating more than 4000 buses daily, and has around 1.2 million daily ridership. The Jakarta government has signed an MOU to retrofit 3000 of its diesel-based buses into EV whilst, at the same time, supplying more EV buses in the coming years.

All of this effort is aimed at changing people’s current commuting behavior, from relying on their private vehicles to using public transport. The key to this behaviour change is not only the ability to build an interconnected and comprehensive transportation system but also the capacity of the government to introduce supporting measures to strengthen the transportation project. These involve increasing fuel prices to encourage people to shift to use public transport, adjusting transport fares, enforcing dissuasively costly parking rates, and providing more park-and-ride facilities, bike lanes, and sidewalks for pedestrians. Indonesia’s gasoline prices, for instance, are relatively low compared to its Southeast Asian neighbors despite already being adjusted in recent years. Indonesia’s 92-octane gas currently stands at 0.94 USD per litre, cheaper than Vietnam (1.03 USD), the Philippines (1.18 USD), Cambodia (1.22 USD), Thailand (1.26 USD), and Laos (1.53 USD). Indonesia also still maintains its popular and highly subsidized 90-octane gasoline (0.68 USD).

Learning from past experience, making a bold adjustment on fuel subsidy will only be feasible during an off-year election, when the elected president enjoys greater popularity and room for action. Unless another bold step on fuel policy and its offshoots is made, the change in commuting urban behavior is likely to be slow.

Despite continued progress on developing urban transport infrastructure, it remains unclear how this sector will be integrated into the national climate action policy. Indonesia has not set a specific emissions reduction target for the transport sector. The official data from the Ministry of Transportation (Kemenhub) related to this issue are not available. This is in part because Indonesia put the reduction in transport emissions within the energy sector, which is the responsibility of the ESDM. Alongside the KLHK, the two ministries are those responsible for producing climate-related documents.

The issue of urban transport is more frequently framed in political and economic terms rather than being positioned as a climate issue. As mentioned, civil society, especially in Jakarta, considers this matter in relation to the exacerbating problem of traffic congestion and air pollution. The air quality of Jakarta was the worst in the world in June 2022, according to the Air Quality Index, making it a contentious issue for debate last year. The environmental issue has only recently

gained greater public attention , mostly because of the government’s new policy on EV. However, long before that, whenever an election in Jakarta draw nears, the issues that capture the most public attention are traffic congestion, provision of public transport, and employment opportunities, rather than environmental concerns.



3.2 Renewable energy infrastructure

Indonesia’s progress in developing renewable energy has been slow, especially in comparison to global targets of coal phase-out by 2040 and reaching net zero by 2050. While it is said that Indonesia may achieve these goals with international financial aid, an updated national energy policy with more ambitious targets is essential to translate the commitments made in the enhanced NDC into action.

Indonesia’s policy on renewable energy is set out in the National Energy Plan (RUEN)³⁶. The RUEN was published by the Ministry of Energy and Mineral Resources (ESDM) in early 2017, shortly after the publication of the first Indonesia NDC at the end of 2016. Due to the limited time frame between the release of Indonesia’s initial NDC in 2016, it is possible that RUEN may not completely align with the NDC. RUEN explains that the proportion of renewable energy in the national

³⁶ Peraturan Presiden Republik Indonesia No. 22 Tahun 2017 about Rencana Umum Energi Nasional (RUEN)

energy mix will be 23% by 2025 and only 31.2% by 2050. To achieve this, the ESDM has planned for the development of various renewable energy power plants, with a greater emphasis on hydropower, bioenergy, and geothermal energy. Even so, the capacity of the planned power plants listed is not sufficient to meet the government’s planned capacity of 45.2 GW by 2025. To address this, the government has planned for the development of renewable energy for direct use through potential supplementary projects. Central government sees this as an opportunity to develop local renewable energy, meaning that local governments can encompass these plans through local energy plans (RUED) utilizing expenditure from local governments and other sources. However, no specific timelines are available yet.

The RUEN suggests that Indonesia has solid potential in developing renewable energy power plants. The potential of geothermal power plants, for example, reaches a total of 11,998 MW in resources and 17,546 MW in reserves. Potential hydropower energy reaches 75,091 MW, while bioenergy can reach 32,653 MW. Other varieties include solar, wind, and mini and micro-hydro power. Power plant development will be according to each province’s main renewable energy potential. Challenges such as the archipelagic state of Indonesia will need to be considered in maintaining the connectivity between all power sources in the national energy mix.

Discrepancies between RUEN and the enhanced NDC are particularly apparent in their longer run targets. In Indonesia’s 3rd Biennial Update Report (BUR), approximately 34.5% of emissions were attributed to the energy sector in 2019, the second largest after FOLU whose emissions contributed to 50.1%³⁷. Indonesia has unambitiously targeted its renewable energy mix to reach a minimum 31.2% by 2050, indicating that approximately 68% of the energy mix may still be sourced from fossil fuels in 2050. The share of oil is set to be less than 20% in 2050, whereas coal and gas should be a minimum 25% and 24 percent, respectively.

As of 2020, the makeup of Indonesia’s total energy supply source is dominated by coal and oil by over 50%³⁸. Oil use has remained relatively steady over the past 30 years (dating back to 1990); however, coal use has gradually increased over time with a spike in increase during 2013. A noticeable decrease in biofuels and waste is also observed. In 1990, the sector could support 44% of Indonesia’s total supply, while in 2020 it only contributed 14%. On the other hand, wind and solar power are slowly making an appearance in the mix with 11% in 2020.

The adverse incentives Indonesia faces in reducing its reliance on coal are an important part of the context. First, the coal-producing regions are numerous. More than half of coal production come from Kalimantan Island, but many provinces in Sumatra and, to a lesser

37 UNFCCC. (2021). Indonesia Biennial Update Report (BUR) 3.

38 IEA. (2020). Indonesia.

extent, Java and Sulawesi Islands, are among coal-rich regions. Coal mining generates direct and enormous regional incomes for these provinces; most of their incomes rest on the ability to sell their raw materials. When the coal price spiked considerably in 2022, the rate of exploration went uncontrolled and caused harmful impacts on the environment and displacement of local communities in areas where coal is mined or transported.

Second, major coal mining companies are associated with the country's key political figures. It is no secret that some of Jokowi's top aides – ministers, retired generals, lobbyists, people from the chamber of commerce, including those from law enforcement agencies – own or hold a large share of stocks in big mining companies. Authorities' measures against unlawful coal explorations are usually only temporary. At the same time, popular pressure on this issue is weak, and infrequent. Environmental NGOs are present, but a lack of financial support may prevent them exercising influence on policy and public awareness in a meaningful way. Sadly, there is little political support to bring this issue into the national policy debate.

Focusing on fossil fuel use in the energy sector, coal makes up 51% of emissions, followed by oil at 36%, and natural gas at 14% in 2020³⁹. The top 3 sectors with the most emissions are electricity and heat producers (42%), industry (25%), and transport (24%). 84% of the electricity and heat sector's emissions are attributed to coal. Indonesia's heavy reliance on fossil energy reinforces the need to reassess energy transition targets. The fact that Indonesia's renewable share has only reached 11.5% by the end of 2021 raises serious questions as to whether Indonesia will be able to reach its 23% renewable share goal by 2025.

Small glimpses of hope may be found in the hydroelectric sector, whose generation is nearing 25,000 GWh nationally in 2020⁴⁰. Geothermal energy has also made a steady increase, with just over 15,000 GWh generated in 2020. Acceleration in other renewables such as solar PV and wind electricity generation has also been observed, yet Indonesia needs greater commitment to catalyse this growth within the next years. The aim of doubling its current contribution within only 2 years is ambitious, and would clearly require significantly more rigorous policy and commitment.

All the data and information mentioned above do not take into account the JETP between Indonesia and its international partners; led by the US and Japan while supported by the UK, Germany, France, the EU, Canada, Italy, Norway, and Denmark. This relatively new financial model combining concessional loans, market-based loans, grants, guarantees, and private investments from public and private entities had previously only been granted to South Africa. Within the next 3 –

39 *Ibid.*

40 *Ibid.*

5 years, an initial USD 20 billion will be mobilized toward Indonesia’s renewable energy landscape, with USD 10 billion from the public sector and the other half from the private sector.

The key objectives of JETP will accelerate Indonesia’s existing climate goals. The JETP aims for power sector emissions to peak by 2030, which is 7 years earlier than the previously proposed target. The targeted power sector emission cap by 2030 is set to be 290 megatons of CO₂, compared to the baseline of 357 megatons of CO₂.⁴¹ Through JETP, Indonesia may also be on track to reach net zero emissions in the power sector by 2050, aligned with the global target.

Indonesia is expected to develop updated energy strategies within 6 months of the launch of JETP. To spearhead this, Indonesia launched the JETP secretariat under the ESDM in February 2023. The secretariat is working on finishing a roadmap for the early retirement of coal-fired power plants, mobilizing investment, and supporting finance mechanisms for the Comprehensive Investment Plan (CIP). Alongside the ESDM, other bodies involved are the Coordinating Ministry for Maritime and Investment Affairs, the State Electricity Company (PLN), and the Ministry of Finance. As the 6-month deadline approaches, Indonesia’s updated plans in the energy sector are awaited by many.

Overall, Indonesia’s energy policies reflect a complex balance between the country’s economic development goals, its abundant coal reserves, political and business linkages, and the growing urgency of addressing climate change through renewable energy and emissions reductions.

3.3 Energy Efficiency / energy supply in the residential sector

Energy efficiency, though not as much discussed as renewable energy, has also made its way into the ESDM’s RUEN. By 2025, RUEN targets the reduction of energy intensity by 1% annually, energy elasticity of less than 1%, and final energy savings of up to 17%.⁴²

RUEN illustrates the need for energy efficiency in the priority sectors of industry, commercial, and household. The emphasis for the industry sector is on more efficient boilers, furnaces, material handling, and cooling. With its energy-intensive nature, however, the government plans for the industry sector to maximize the use of fossil fuels. Targets of coal use reach 55.2 million tons in 2025 and 115 million tons in 2050. The objective for the household sector is to increase the use of bioenergy by gradually adding it into the mix. Other objectives include phasing out kerosene and shifting fuel use into gas use. “Luxury” houses, cluster neighborhoods, and apartments will be obliged to install solar cells on at least 25% of their rooftop area

41 ASEAN Breifing. (2023). Indonesia’s Just Energy Transition Partnership: Impacts for the Green Economy.

42 See RUEN

through a building permit. Several plans to widen the use of biogas are also in place. In the commercial sector, energy efficiency is promoted through an increase in the use of energy-saving technology and implementation of energy audit and management. The government also plans to develop standards for energy-efficient buildings.

Other flagship programs in support of energy efficiency are energy management and energy efficiency investment. Industries that use at least 6000 TOE annually are required to conduct energy conservation through energy management, for example, to appoint an energy manager, arrange energy plans, conduct energy audit reports, and implement audit recommendations. These energy-intensive industries, including pulp and paper, steel, and iron, are encouraged by the government to do Investment Grade Audits (IGA). In the public sector, energy efficiency is also supported by investment schemes between government and business entities, for example through the public street lighting program run by the ESDM.

Green buildings are another focal point for energy efficiency, especially in the household and commercial sectors. The Ministry of Public Works (PUPR) is in charge of green building codes and implementing green building standards. One case study of a retrofitted green building is the Energy Efficiency Conservation Clearing House Indonesia (EECCHI), located on the 5th floor of the Directorate General of Electricity Annex Building. After the retrofit, energy consumption was reduced by 40%.⁴³ Increased natural lighting penetration, the use of prefabricated double-glaze glass windows, and the use of multi-split variable refrigerant flow air conditioning contributed to the reduction. Compared to before retrofitting, over 50% of energy (kWh/m²) was saved annually, equivalent to saving Rp22.302.000 per floor/year, with a 22.45-ton reduction of CO₂ emission, and a 19% noise reduction.

The missing link in energy efficiency implementation in Indonesia is the lack of awareness among businesses and homeowners, which is linked to a lack of incentives. The lack of active socialization of energy efficiency programs by the government hampers public awareness of the options available, resulting in practices as usual. Supporting policies are weak; parties who are already willing to practice energy efficiency are challenged with incoherent and inconsistent policies instead. Considering the higher initial costs of energy efficiency, incentives are needed to catalyse new technology adaptation, as seen in a case study of the acceleration of energy-efficient technology in Indonesia⁴⁴. While Indonesia has created a foundation for energy efficiency, more effort must be exerted to overcome these challenges to increase energy efficiency adaptation throughout all priority sectors.

43 Kementerian ESDM. (2012). Buku Pedoman Energi Efisiensi untuk Desain Bangunan Gedung di Indonesia, 3: Studi Kasus dan Informasi Tambahan.

44 GIZ. (2017). Kebijakan Pendukung dan Insentif Finansial untuk Mengakselerasi Penerapan Teknologi Efisiensi Energi pada Sektor Refrigeration dan Air Conditioning di Bangunan.

4. Summary of findings

Indonesia has generally received a poor international assessment of its national climate actions and policies. The emissions reduction target as stated in the NDC document is considered too low and does not reflect a fair share of Indonesia’s high emissions. In addition, the government’s policies on coal have also remained relatively permissive, with continued support for the expansion of coal-fired power plants. Although there has been increasing recognition of the need to shift towards renewable energy sources, a bolder and more ambitious set of policies is essential to accelerate Indonesia’s reduction of carbon emissions.

Indonesia’s political structure presents both opportunities and challenges. While there are some positive signs of commitment to addressing climate change, a lack of political will and the influence of vested interests continue to hinder progress. The powerful coal lobby, which includes influential business interests and political elites, has been a significant barrier to more ambitious climate actions. Given that coal exports are a major source of revenue, policy decisions related to coal are often driven by economic considerations rather than environmental or climate concerns.

The decentralization of power has resulted in a complex policy landscape, with multiple levels of government and overlapping responsibilities. This can make it difficult to coordinate action and ensure consistent implementation of climate policies across different regions and sectors. To be sure, democratic and decentralized systems allow for more public participation in decision-making, including on policy and measures related to climate change. Having more regional power may also boost a sense of shared responsibility to take more serious measures. However, the level of public and civil society engagements in decision-making is uneven across different issues. The understanding about the complexity of climate policies is much less than other issues such as corruption, unemployment, and food prices – contributing to a weaker level of engagement and magnitude among Indonesians. The 2019 survey conducted by CSIS reported that only 1.6% of Indonesian viewed environmental issues as important.

The lack of public awareness thus far means that the approach of Indonesia’s national climate policies is largely state-centred. It is safe to say that climate policy plans, adjustments, executions, and evaluations will come mainly from the state and – as an extension – the elected leaders and ruling parties. Under circumstances where the country has a weak political will and no political parties provide adequate policy platforms on climate actions, climate initiatives are likely to continue to be disordered and inconsistent across sectors. Therefore, international support in the forms of financing, technical and technological assistances, and capacity trainings are all essential for Indonesia.

The progress made and challenges faced within the three sectors – transport infrastructure, renewable energy, and energy efficiency – reflect our assessments. For instance, investment in transport infrastructure is long overdue. Inadequate investment in transport infrastructure results in regional disparities, poor delivery of transportation services, and exorbitant costs that impede the economy from achieving its full potential. President Jokowi has made notable achievements to tackle these problems, some of these include rapid development of toll roads that reduce travel time and increase regional connectivity, improvements of seaports, airports, the development of high-speed railway and Jakarta’s MRT and LRT. The government has also set up a better policy package on EV by providing tax incentives and subsidizing the purchase of new EV vehicles. However, climate considerations are a very minor factor in both overall policy and individual investment decisions in the transport sector. The use of gasoline is still major contributor to the country’s greenhouse emissions. Several rounds of fuel price reforms to reduce subsidies have been implemented, but the heavily subsidized 90-octane gasoline is maintained.

In the renewable energy sector Indonesia’s progress has been slow. The total energy mix supply that comes from renewable sources is set 23% in 2025, but the total renewable share has only reached 11.5% in 2021. While oil will be less than 20% in 2050, coal will be at minimum 30% in 2025 and 25% in 2050 – as opposed to the global plan to completely phase out the use of coal in 2040. The extent to which Indonesia’s future reliance on fossil-based energy could hamper its 2050’s emissions target is unclear. There are some positive developments on renewables such as hydroelectric, solar PV, wind and geothermal power. In fact, Indonesia is the country with the second-largest geothermal reserves and installed capacity with 2356 MWe in 2022, only outperformed by the United States.⁴⁵ The recent development on international financing in the form of JETP to speed up the renewable energy landscape is a key factor in relation to future performance. With JETP now in place, Indonesia is expected to have a revised national energy policy by the end of 2023.

Although not as widely discussed as the renewable energy sector, energy efficiency has also been incorporated into the ESDM’s RUEN. The document illustrates the need for energy efficiency in priority sectors of industry, commercial, and household. As part of the building permit requirements, “luxury” homes, cluster neighborhoods, and apartments are obligated to install solar cells on at least 25% of their rooftop area. Additionally, there are plans in place to expand the use of biogas. The commercial sector aims to improve energy efficiency by increasing the adoption of energy-saving technology and implementing energy audits and management, whereas energy conservation measures for equipment such as boilers, furnaces, and cooling systems are prioritised for the industrial sector.

45 Richter, Alexander. (2023). ThinkGeoEnergy’s Top 10 Geothermal Countries 2022 – Power Generation Capacity (MW).

Aside from the three sectors, another significant area of interest is forestry and land-use. Alongside energy sector, forestry and land-use play a significant role in contributing to Indonesia’s NDC target, accounting for 97% of it. Forestry accounts for approximately 64% of Indonesia’s land territory and has the capacity to absorb and store carbon pools, and will play a critical role in both the mitigation and adaptation strategies. One of the most notable recent policies is the moratorium on new permits for logging, mining, and plantation development in primary forests and peatlands. In addition, the government has established a national REDD+ strategy to reduce emissions from deforestation and forest degradation, which includes initiatives such as sustainable forest management and peatlands restoration. Other policies aimed at promoting sustainable land-use practices include the development of a national land-use plan and a community-based forest management program.

In our view, more effort is clearly needed to increase Indonesia’s climate awareness. Indonesians have always been a communal society where people tend to look out each other. Aside from the family, ethnicity, tribes, and religions play a critical role in shaping how society works together. Civil society needs to engage with local leaders more. Local leaders, such as village chiefs, religious leaders, and community organizers, can play a crucial role in increasing awareness on climate issue given their strategic positions within their own communities.

Public education campaigns will need to be continued. NGOs and civil society organizations can launch public education campaigns in the forms of seminars with key potential actors, workshops, and public meetings to raise awareness on climate change and its impacts. These have been done to some extent, but their area focus has disproportionately targeted big cities only. Their limited reach might be attributable to lack of funding. But more widespread and diverse audiences need to be targeted for a better climate actions support.

Finally, given that Indonesia’s energy sector is closely tied to political and business interests, Indonesia may need to balance its energy reform in a way that does not significantly hinder its energy policy establishment. An outright energy reform that completely phases out coal reliance, for instance, may seem politically unrealistic at this point. But gradual changes on policies related to energy sector that consider the interests of established groups and, at the same time, integrating them within the ecosystem of renewable energy may be possible. This is an important message that is rarely understood by outside observers of Indonesia.

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Country template

Assessment of governance and climate action

South Africa

Prepared by: Yorokee Kapimbua
June 2023

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List of abbreviations

ANC	African National Congress
AfDB	African Development Bank
BEE	Black Economic Empowerment
BRT	Bus Rapid Transit
CNG	Compressed Natural Gas
CSP	Concentrating Solar Power Plant
DEA	Department of Energy Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DFIs	Development Financing Institutions
DNC	Defined National Contribution
FOLU	forestry and other land use
GIZ	Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation)
GHG	Greenhouse Gases
INEP	Integrated National Electrification Programme
UITP	International Association of Public Transport
NCCRWP	National Climate Change Response White Paper
NCOP	National Council of Provinces
NCCR	National Climate Change Response
NEFC	National Energy Efficiency Campaign
NDC	Nationally Determined Contributions
NGOs	non-governmental organizations
OPIC	Overseas Private Investment
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RSA	Republic of South Africa
SACN	South Africa Cities Networks
SEA	Sustainable Energy Africa
TIMBER	Technology, Infrastructure, Market Changes, Behaviour, Energy and Regulation
UTOA	Urban Transport Organizing Authority
UNFCCC	UN Framework Convention on Climate Change
UATP	African Association of Public Transport
WWF	World Wildlife Fund

1. Context and characteristics of national governance

The South African government machinery comprises three arms:

The National Assembly is made up of members of Parliament, elected every five years. Laws and policies are approved by Parliament which is made up of the National Assembly and the National Council of Provinces (NCOP). The Legislature constitutes the National Assembly (more of Central government thus Executive and Parliament) and National Council of Provinces (Local Government) who act independently of each other. On matters of national interest, occasionally, the two bodies would act jointly (Constitution of the Republic of South Africa, 108 of 1996).

The elected members (legislatures) – who represent the public, approve policies and laws and monitor the work of the executive and departments. The Executive committee (Cabinet) co-ordinates the making of policies and laws and oversee implementation by the government departments. The Executive is led or chaired by The President who appoints Cabinet Ministers as Political Heads of government Ministry portfolios. The Ministers are assisted by public servants who develop policy proposals for legislative debates, prepare development budgets, and drive policy implementation and evaluation (Constitution of the Republic of South Africa, 108 of 1996).

Therefore, government departments and the public servants who staff them, are responsible for doing the work of government and are accountable to the Executive. The Judiciary arm of government constitutes a mixed legal system. This complex legal architecture has to be understood in the context of the country's history of multiple colonialism, which left behind a mix of Roman Dutch civilian law, English common law, customary law and religious personal law. The Judiciary is also defined as part of government, but they are independent so that courts can protect citizens without being influenced or pressurised by government. The independence of the Judiciary is a cornerstone of constitutional democracy. It guarantees the supremacy of the Constitution (Constitution of the Republic of South Africa, 108 of 1996).

However, the effectiveness of the Judiciary in guaranteeing the rights of the people has been weak in some instances. For example Greenbaum (2020) noted "that the achievement of access to justice is impeded by a number of factors, including socio-economic inequalities, systemic inefficiencies caused by poor administration at the courts and an unmet demand for legal services. It will require the allocation of significant financial and human resources to overcome the obstacles preventing those who cannot afford the cost of private legal representation from effectively accessing the legal system."

Against this backdrop, South Africa can be seen as a democratic



country, as demonstrated by free and fair elections every five years. However, it faces serious challenges from the lack of government accountability due to rampant corruption, inequality, poverty, threats to civil liberties due the depth and level of unemployment and crime, xenophobic attacks and racial discrimination (Greenbaum, 2020). The poor balance between state and corporate power is the root of a fragile democracy in South Africa as observed by Lodge 2002 “a government wedded to the interests of the private sector”. Political freedom in terms of multiparty democracy did not translate into sustainable and inclusive economic growth opportunities for all.

Although citizens can voice their concerns over poor governance and lack of accountability using a variety of platforms on issues such as pollution from industries, land degradation from extractive industries, the regulation of the private sector is still weak (OECD, 2018). This means that the majority of ordinary members of the public have limited rights compared to the power of corporate owners. The level of public and NGO participation in the formulation and implementation of public policies is relatively satisfactory. There is no integration of bottom up and top down development of policy and implementation, hence the lack of sustained progress on issues such as poverty, inequality and unemployment.

National climate policymaking

South Africa actively participates in the UNFCCC and other treaties relevant to the mitigation of climate change issues, including the Paris Agreement. The determination and implementation in practice of the Nationally Determined Contributions in South Africa are influenced primarily by a combination of development needs and the threats



emanating from climate change. In particular, the levels and depth of poverty and extreme inequality are key contextual factors. South Africa faces acute energy challenges that hinder economic growth, hence the decision by government to transition to climate resilient policies and practices as a strategy to curb poverty and inequality.

These measures are also geared at mitigating other pressing issues of national concern in South Africa. Different action plans and policies have been developed and implemented in accordance with section 24 of the constitution of South Africa which provides for 'the environmental right'. These policies and action plans include: the National Development Plan, the National Climate Change Response Policy, and the National Sustainable Development Strategy. Significant policies and action plans on climate change such as the integrated energy and electricity plans (IEP and IRP), industrial policy action plans (IPAP) and the new growth path (NGP) have been successfully implemented (IRENA 2021).

However, despite the implementation of these policies, South Africa is some way from the emissions reductions necessary to achieve the NDC target (350–420 MtCO₂e) for 2030. The second target set by South Africa is achievement of Net Zero by 2050. Public consultation takes place on key policymaking issues, such as the Climate Change Bill of June 2018. Despite delays, the bill was approved by Parliament in 2022 following Cabinet presentation (Climate Transparency Report 2020).

Different initiatives continue to emerge in the quest to meet the government's obligations in reducing emissions. An example is the Presidential Climate Commission of 2022, whose primary objective is to

advise government on policymaking in relation to the linkages between climate and development issues. The Just Transition framework, which is an output of the Commission, seeks to ensure effective transitions to low carbon emissions, though the results are not yet visible.

In terms of the National Climate Policymaking landscape, funding is not a challenge for South Africa. A financial package of USD 8.5 billion grant facilitated by donor countries such as France, Germany, the UK, the USA, and the EU was secured by South Africa at COP26, with the objective of transitioning South Africa to renewable energy from coal energy sources. However, there is a lack of public information on implementation of this agreement.

Another policy gap which weakens South Africa’s Just Energy Transition Plan is the country’s failure to sign up to the Glasgow Sectoral Initiatives. These sectoral initiatives include action on methane, stopping the use of coal, 100% Electric Vehicles, and forests. South Africa is not a signatory to any of these; hence not making them part of the NDC. This undermines the country’s commitment to the reversal of deforestation and land degradation (Meridian Economics, 2020).

South Africa depends on coal for 97% of its primary energy. This has adverse effects on water resources, food security, health, infrastructure and ecosystem services and biodiversity. The other major sectoral contributor to South African Green House Gas emissions are the Agriculture, Forestry and Other Land Use (AFOLU) sector. However, there is a dearth of policies in South Africa to ensure that the agricultural and forestry sectors implement climate friendly practices. The Long Term Mitigation Strategy (LTMS) exists in principle, but there is as yet no information on the status of implementation. The National Climate Change Response Policy makes reference to climate smart agriculture (CSA), which “that lowers agricultural emissions, is more resilient to climate changes, and boosts agricultural production”, yet there is no reporting on the expected or actual mitigation impacts gained so far. Therefore, the level of agricultural emissions level is significantly high compared to the global rating of 1.25 tCO₂e/thousand USD in 2014 (IPPO, 2021). This means that opportunities for mitigation in the agriculture sector are available at a low cost compared to the global average, but are not being pursued.

Evidence suggests that South Africa’s performance against the Modelled Domestic Pathways is inadequate. Although the country (Cabinet) approved the Integrated Resource Plan in 2019, albeit only after significant delays by the political leadership, commitment to effective implementation of the intended flagship policies is lacking. The Integrated Resource Plan, Green Transport Strategy and Just Energy Transition Plan are promising policy announcements from the South African government. However, there is little happening on the ground in terms of implementation. Essentially, South Africa is far off track in achieving the 1.5°C temperature limit. It is projected that given

the present policy framework and level of implementation, South Africa will fail to meet the revised NDC target by 2030.

The Covid 19 pandemic led to a significant shift in policy and political commitment to the implementation of the NDC targets. Although the Economic Reconstruction and Recovery Plan of 2020 includes measures to ensure implementation of low carbon emissions activities, evidence suggests that South Africa missed the opportunity to build back green. The Global Recovery Observatory 2021 report noted that the country spent only 3 percent of its budget on green and low carbon emissions commitments. This is a big contradiction to the country’s purported mission to mitigate emissions as a means to realisation of the National Development Plan (NDP) on sustainable development, poverty alleviation and mitigation of inequalities by 2030. This is a significant step back from the country’s aspirations, and from both its domestic and international commitments.

A different scenario is possible if the policies and plans approved by government are implemented fully. South Africa could reach the 416 MtCO₂e emissions reduction target if initiatives such as the carbon tax, renewable energy procurement, an effective transition to low carbon transport, and energy saving measures are implemented at scale.

Following the Paris Agreement negotiations, the target of a reduction in domestic emissions of greenhouse gases of 34% in 2020 and 42% by 2025 (GIZ, 2017) was adopted by the South African government, through its NDC. One of the key measures planned by South Africa is the introduction of environmental taxation which will make it one of the first countries in Africa to implement such a reform. This taxation system aims, among other things, to reduce the use of fossil fuels such as petrol, diesel (Republic of South Africa, 2021). South Africa’s high emissions are mainly due to the country’s reliance on coal energy. The emissions of the road transport sub-sector are strongly correlated with diesel consumption.

There is high participation by non-governmental organizations, local authorities and private firms in supporting the South African government in meeting its environmental objectives. The TIMBER programme (Technology, Infrastructure, Market Changes, Behaviour, Energy and Regulation), was launched in 2011 with the aim of reducing carbon emissions in goods transportation, and benefits from the participation of many private sector firms.

The efforts of NGOs such as Sustainable Energy Africa (SEA), World Wildlife Fund (WWF), South Africa Cities Networks (SACN), Greencities, African Association of Public Transport (UATP) and its parent company, the International Association of Public Transport (UITP), are important in South Africa. These organizations often take the role of catalysts in the implementation of sustainable mobility strategies in South African cities. Their work feeds into national

strategies coordinated at government level such as the IEP and IRP. Municipalities are responsible for coordinating the strategies at local or regional level to ensure effective implementation. Key sectors such as tourism, agriculture, mining, transport, fisheries, housing have specific regulations governing actions and decision making to ensure that climate change issues are mainstreamed in policy and practice. Academic institutions are also pivotal in conducting scientific research which feeds into climate change and policymaking at both national and regional levels (DEA, 2017b).

2. Sectoral information

In order to examine how the political structures identified in section 2 above, and the national climate policymaking outlined in section 3 above, affect decision-making in relevant sectors, we have looked in each country at how decisions are made on transport infrastructure, renewable energy infrastructure, and energy efficiency/energy supply in domestic housing. The following sections address each of these for South Africa.

2.1 Transport infrastructure

Policy Context:

Road transport is the primary source of transport-related GHG emissions in South Africa, accounting for 91.2% of the total. This is chiefly attributed to the heavy dependence of the sector on fossil fuels. Like elsewhere, a significant share of the development budget is allocated to transport infrastructure development such as construction, upgrading and maintenance of roads in South Africa.

In South Africa, the transport sector (including road transport) is the third largest emitting sector, accounting for 55 Mt CO₂ emissions, more than 10% of the country's total emissions. For instance, in 2021 Transport had the highest dependence on fossil fuels which accounted for 37% of Carbon Dioxide emissions. This indicates an increase of GHG emissions from fossil fuels from the transport sector of the total national contribution of other sectors.

Environmental measures to regulate road construction include: the requirement for Environmental Impact Assessment (EIA), the creation of the National Environmental Management Authority (NEMA), Acts on Air Pollution, Water Pollution, and Noise.

The Department of Transport published the country's first Green Transport Strategy (GTS) 2018–2050 in 2018, making proposals on measures to be implemented in transitioning the sector towards a low carbon future. However, evidence suggests that the contribution of zero emissions fuels must reach 20% by 2030, 50-60% by 2040, and

80%-90% by 2050 to meet the commitments made under the Paris Agreement. The South African Biofuels Industrial Strategy allows biofuel blending of 2%–10% for bio-ethanol and a cap of 5% for biodiesel. The Biofuels Regulatory Framework (BRF) was passed by government in 2020 to implement the Biofuels Industrial Strategy. It is unclear what the socio-economic benefits to be achieved through the BRF will be (DEA, 2017b).

Road transport policies and initiatives aimed at reducing emissions include: vehicle fuel economy standards (in 2005), a vehicle labelling scheme (in 2008), and a carbon emissions motor vehicles tax (in 2010). South Africa’s Electric Vehicle Industry Roadmap (2013) aims to increase uptake of electric passenger vehicles, but by August 2020, there was no evidence of local manufacturing or purchasing incentives as indications of progress in achieving the roadmap. In May 2021, Government released the ‘Auto Green Paper’ for public consultation (Department of Trade Industry & Competition, 2021), although final approval has been delayed. Two major concerns were raised from the public consultations which included affordability, and the capacity to provide charging infrastructure. The ‘Auto Green Paper’ objective is to map South Africa’s plan for a clear and long-term automotive industry transformation strategy on low-carbon vehicles. Evidence indicates that electric vehicles contribution to yearly vehicle sales in South Africa would need to reach 50-95% by 2030 and 90-100% by 2040 to align with the Paris Agreement commitments (Meridian Economics, 2020).

URBAN FORMS AND MODES OF TRAVEL

Economic success naturally leads to changes in ways of life and behaviours. South Africa, the biggest economy on the continent, is no exception to this rule. A high rate of motorization has hit the country not only because population income levels are rising, but also due to the strong presence of the automobile industry (Volkswagen, Toyota, etc.). Competition in the domestic automobile market has made cars easily accessible to individuals.

Moreover, the urban form of South African cities characterised by non-dense residential zones and urban sprawl also helps to explain high motorization rates. Among apartheid’s negative effects was a distortion of the development of the transport sector: public transport development was constrained by the objective of keeping populations separate, meaning that the services provided were aimed at a fixed group of customers. This meant that individual modes of transport became preferable and their growth has made a large impact on environmental pollution levels, including through the greenhouse gas emissions and poor local air quality.

The South African authorities have long claimed to have real ambitions to combat climate change through programmes and policies to reduce

greenhouse gas (GHG) emissions at a national level. However, beyond a few legislative and regulatory measures, meaningful actions are late arriving.

In its Nationally Determined Contribution (NDC), South Africa claims to be pressing hard on the “Transport” lever to contribute effectively to the global effort to reduce GHG emissions. It is now committed to mobilizing financial means to invest in the promotion of sustainable transport systems that respect the environment.

Through the “National Climate Change Response Paper (NCCR)”, South Africa intends to improve the energy efficiency of its vehicle fleet, thus encouraging green technologies such as electric and hybrid vehicles. The goal set by the state authorities is to put 3 million electric cars into circulation by 2050 and make an investment programme worth R6.5 million (around \$350,000) available to green technology industries (GTS, 2016-2021).

Beyond the legislative and regulatory measures, the public authorities have put in place programmes aimed at developing renewable energy sources for use in the road transport sector. Examples include decarbonisation initiatives in the goods transport domain, and the introduction of a system of road tolls. Across the whole network, 16% of roads are now equipped with toll booths. The reduction of traffic on these roads resulting from the cost of the toll would result in a gain for the country in terms of reducing CO₂ emissions in the road sub-sector (SANRAL, 2013).

Although road transport emissions continue to dominate the transport sector overall, we should note that the quantity of CO₂ it generates has remained stable in the last few years with slight, and occasionally negative, variations. This situation is in many ways down to private initiatives.

CASE STUDY:

The major South African transport infrastructure development is the GauTrain. This is an 80-kilometre rapid transit railway system which connects Johannesburg, Pretoria, Ekurhuleni and OR Tambo International Airport. The Gautrain is a public private partnership project which got approval from South African Cabinet in 2005, and its budget released in 2006. It was constructed with the aim to relieve the traffic congestion in the Johannesburg–Pretoria traffic corridor and provide commuters with an affordable alternative to road transport. The GauTrain project communication unit successfully identified and engaged relevant stakeholder groups such as passengers, employees, media, communities and suppliers. There was less resistance to the construction of the project because of the perceived socioeconomic benefits such as employment creation, fast mobility between the cities and a reduction in road related mortalities from accidents.

Pockets of resistance emerged around the awarding of the tenders to the contractors. Some members of the private sector believed the designers of the project were less qualified and experienced, which led to delayed project completion at high cost. However, their efforts to ensure proper quality assurance measures were only partially successful, as vested interests dominated the project construction.

The project complied with the requirement for an Environmental Impact Assessment. However, climate change was a secondary objective in the EIA process, as the ultimate objective of the construction was to ease traffic congestion in the Metropolitan areas. The EIA focused on issues related to environmental standards such as the impact of the project on land and environmental quality. In terms of social and political decision making the Gautrain stimulated economic growth and job creation, integration of communities and economic inclusion. It is projected that the project has had an added economic value of R46 billion (\$2.45billion) total GDP impact to the provincial economy from property development contributing a further 245, 000 jobs. Gautrain is a sustainable transport system, which minimises consumption of non-renewable resources and optimises the use of land. The rapid train system produces on average, per passenger kilometre, 95% less carbon monoxide, 92% fewer volatile organic compounds and 48% less nitrogen oxide (WWF, 2016).

2.2 Renewable energy infrastructure

Policy Context

Policies on renewable energy infrastructure development in South Africa seek to ensure significant reduction of emissions through scaled up use of renewable energy. The Integrated Resource Plan (IRP) 2010–2030, introduced in 2010, sets out the government’s plan for the electricity sector, with targets for all technologies, including renewable energy. The revised plan aims to cut down over 35 GW (of 42 GW currently operating) of the public electricity utility (Eskom)’s coal usage by 2050. Short term targets are for reductions of 5.4 GW by 2022 and 10.5 GW by 2030 (DEA, 2019).

In 2020, renewables contributed 10.5% of the South African national energy supply. However, this was below the expected 11.5% due to more coal plants that have been completed. The country’s power generation is currently reliant on coal, which means that South Africa is well below behind the world trend in the path to clean energy. South Africa has 19 wind energy developments with more than 600 wind turbines, yet fails to meet the national energy demands. This has been attributed to poor political commitment to renewable energy technology adoption in South Africa. For instance, there are no clear regulations, disparate policies at regional (state) level, and limited government support, all of which hinder investment in renewable energy (DEA, 2017).

The White Paper on Energy Policy (2004) is an overarching document which sets out the government’s official policy on the supply and consumption of energy for the next decade. It represents for the first time a comprehensive and holistic perspective of South Africa’s official overall energy needs and options. Its position on renewable energy is based on the integrated resource planning principle of “ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options”.

The White Paper on the Renewable Energy Policy (2004) of the Republic of South Africa complements the White Paper on Energy Policy, by pledging “Government support for the development, demonstration and implementation of renewable energy sources for both small and large-scale applications”. It sets out policy principles, goals and objectives to achieve an energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation. It identifies the following forms of renewable energy in South Africa:

- Solar: South Africa has some of the highest levels of solar radiation in the world and tourist brochures refer to “sunny South Africa”; however solar energy currently provides only about 10% of the country’s primary energy needs. Solar power has tremendous potential and is the fundamental component of the country’s rural energy programme, addressing the needs of millions of people do not have access to the national grid; -
- Biomass (in the form of firewood, wood waste, dung, charcoal and bagasse)accounts for about 10% of net national energy use and for 60% of household energy consumption; -
- Hydro power: Both small scale and large hydro generators have potential in SA but currently less than 1% of electricity generated in South Africa comes from hydro-electric power; -
- Biogas and landfill gas, which address thermal energy needs;
- Wind energy:. a number of experimental wind farms have been built and is also suited to both small-scale battery charging systems as well as large scale win-farms (DEA, 2017; DEA 2019).

CASE STUDY:

The Redstone Concentrated Solar Plant Project is located between Tsantsabane and Kgatelopele in the Northern Cape, and is expected to fill electricity demand concerns, create employment opportunities, cut down on coal usage and reduce carbon emissions. The ultimate

objective of the project is to add more electricity to the national grid, GHG emissions reduction is not the intrinsic (main) motivation. There has not been opposition to the project construction.

The project construction is estimated to be at 45.5 percent completion as at April 2023 and to be operational by February 2024. The solar plant is expected to contribute 100MW to the national grid, and to supply 400 000 households with electricity. The project is designed to remove 480 Kilotons of carbon dioxide emissions and to use less than 200 000 cubic metres of water per year. Government estimates the lifetime of the project to be around 20 years, with R575 million (\$30m) of the project budget invested on “socio-economic development programmes.” At present it is estimated that over 3,500 employment opportunities have been created. The Redstone Project is funded from a ZAR3bn (\$192.4m) loan facility by the African Development Bank and Overseas Private Investment in the form of a \$400m loan. The project has adhered to the EIA standards as required by the law, mainly to ensure environmental quality and safe land practices. The residents (Tsantsabane and Kgatelopele) of the Northern Cape were consulted prior to the commissioning of the project. Other key stakeholders including the Municipalities, businesses and civil society formed part of the consultation processes leading to the construction of the project (Department of Forestry, Fisheries and Environmental Affairs, 2021, AfDB, 2018).

Project Summary:

KEY PROJECT BENEFITS

- No requirement for natural gas or oil back up – completely emissions free
- Supports South Africa’s renewable energy programme with the most advanced solar technology, delivering clean energy, day and night
- Energy storage capabilities provide non-intermittent electricity supply to meet peak demand requirements
- Supports South Africa’s growing demand for generation capacity stimulated through economic growth
- Significantly reduces the use of water for cooling by using an efficient, low-water dry cooling system

ECONOMIC BENEFITS

- **Financing:** Equity investment and debt provided by local and international lending institutions including DFIs, with a significant Black Economic Empowerment (BEE) shareholding
- **Tax Revenues:** Project forecasted to contribute more than R7 billion(\$500m) in income tax to the fiscus over the first 20 years of operation
- **Operating Expenses:** During the more than 30-year operating life, the project will expend over R150 million(\$8.1m) per year in salaries and other operating costs, including land, insurance, and maintenance activities, much of this spent in the region

- **Job Creation:** More than 4,000 jobs during the construction phase including craft workers on site as well as jobs related to equipment supply, manufacturing, engineering, transportation and other services; during operations there will be over 80 full-time, permanent jobs
- **Localization:** A significant proportion of procurement and labour will be derived from South Africa, growing from the experience and supply chains developed through construction of the two PV projects at the same location
- **Preferential Procurement:** During construction, in excess of 43% of capital costs will be spent on South African content.

A comprehensive Stakeholder Engagement Plan is in place and implemented in collaboration with the communities where the project is executed. The project is running on schedule, with significant milestones achieved so far, and demonstrates what can be achieved when political commitment is available. However, in general South Africa’s political commitment to decarbonisation is weak in practice, hence the slow or absent implementation of the critical instruments necessary to fast tracking reduction of GHG emissions.

2.3 Energy efficiency/ energy supply in the residential sector

Policy Context

National policies regulating access to energy in domestic households include:

- the Integrated National Electrification Plan (INEP), providing national access to electricity in South Africa,
- Free Basic Electricity (FBE), a subsidy introduced to help households to move away from using unreliable and harmful substances for energy,
- Free Basic Alternative Energy (FBAE), which helps households without electricity connection with subsidies for alternative energy, the Inclining Block Tariff (IBT), a subsidy introduced in 2010 to cushion poor households from rising energy prices,
- the National Solar Water Heater social programme, initially conceived as a response to environmental sustainability and energy challenges, and then turned into a Social Programme aimed at employment creation and household welfare services is the ultimate objective (the programme has been ineffective due to institutional, financial and technical issues that stalled implementation since 2010, hence only an insignificant (395 088) number of households has had heaters installed).
- the Energy Efficiency Strategy (the Strategy), which aims to assist in providing energy for all residents of South Africa, by reducing energy consumption through efficient practices and sustainable energy development. This assists in reducing the

effects of energy usage on human health and the environment (DEA, 2019).

For the residential sector, measures such as standards and labelling for energy-efficient appliances, installation of smart meters, incentives for solar water heaters as well as solar PV should be considered. Enhancing the efficiency of water heating is one of the main “low hanging fruit” measures. Smart meters allow time-of-use tariffs, with higher rates to encourage users to alter consumption patterns and help to reduce peak demand. They also provide a basis for smart grids, allowing households to generate their own power (e.g. PV installations) and sell excess power to the grid. This would also require changes in the regulatory regime (DEA, 2017).

The electrification programme has positively impacted social welfare. Poorer households who could not afford a connection and the basic use of electricity are now connected to the grid – or have access to other forms of energy – and are more integrated into society. However, despite the progress South Africa has made, around 11 percent of households still do not have access to electricity. Such households rely on substitute sources of energy which contribute to environmental degradation and present health hazards to households (DEA, 2019).

The Integrated National Electrification Programme (INEP) was set up in 2002 as the main electrification programme in South Africa. Through INEP, the South African government uses public sector financing for electrification and infrastructure development. To date, INEP has been the South African energy-related policy that has had the greatest impact in facilitating energy access, especially for the poor. However, access to electricity is not the only issue faced by poorer, which may not be able to afford the minimum amount of electricity to cover their basic energy needs (Presidential Climate Commission, 2021).

Low-income South African households consume between 5% and 10% of their total energy in lighting; space heating and cooking account for the remainder 85–90% of their total energy consumption (Department of Public Enterprises, 2019). Evidence shows that despite receiving 50 kW/h of free electricity per month to help them cover their basic energy needs, poorer households still use various other sources of energy including wood and paraffin to satisfy their basic energy requirements. Solid fuels are predominantly used in rural areas where around 75% of non-electrified households rely on solid fuels for cooking, heating and lighting. Residential coal use on the South African Highveld is such a case. The region regularly experiences poor outdoor air quality, and the use of traditional coal stoves exacerbates pollution levels for residents.

The National Energy Efficiency Campaign (NEFC) which aims to promote behaviour change in the use of energy in the households has been effective to some extent. The home energy efficient messages focus on these saving tips:

- Get ceiling insulation installed in your home.
- Make sure your boilers are wrapped with boiler blankets.
- Turn boiler temperature down to 60 degrees C.
- Buy energy-efficient light bulbs.
- Use energy-efficient exterior lights for spotlights.
- Install a solar water heater or heat pump

The efficacy of the campaign is hard to measure in rural and peri urban settlements because of the high levels of squalor and poverty. Therefore, as indicated above, South African Highveld areas continue to depend on coal usage for energy needs which is detrimental both to human health and the environment.

3. Summary of findings

The South African policy landscape is fairly supportive of the ideals of action on climate change issues. The existence of policies that reflect to a large extent the provisions of the constitution is commendable. However, there is more to be done for South Africa to escape the impending status of being declared a failed state. There is need to improve accountability in terms of policy implementation, and adherence to both national and international obligations on climate change. A useful step would be to sign up to collaborative measures such as the Glasgow Sectoral Initiatives, which are quite relevant to South Africa’s vision to addressing poverty and inequality.

The development of sectoral level policies in South Africa is skewed by the greenhouse gas emissions profile of the country, with high-emissions sectors such as energy having more developed climate policy landscapes. However, since 2010/11 climate change policy overall and, in particular, mitigation policies in the energy sector have been delayed. Policies on adaptation and resilience have had little focus to date (UCT, 2021).

A National Climate Change Adaptation strategy released in 2017 for public comment has been approved, which provides accountability towards systemic implementation of South Africa’s nationally determined contribution (NDC) to the Paris Agreement. This is critical in determining South Africa’s strategy for energy generation in the future. It is also relevant for other sectoral policies, including the Industrial Policy Action Plan and others.

Horizontal and vertical mechanisms for climate change governance are comprehensive but their effectiveness has varied. Technically, South Africa has a comprehensive system for vertical and horizontal coordination (UCT/PCC 2021). The Inter-Ministerial Committee on Climate Change, Intergovernmental Committee on Climate Change and the Forum of South African Directors General are the key mechanisms

for coordination. However, ensuring coherent policy formulation and implementation remains challenging due to the fragmented nature of responsibility for climate policy. This has created ambiguity on how policies will be jointly implemented and aligned, which in turn reduces the effectiveness of the public sector in preparing and implementing climate policies.

Mistrust of public-private engagement to facilitate horizontal coordination between stakeholders is also a challenge, and impedes discussions to build informal and personal relationships. These tensions arise due to mistrust, difficulties in historical relationships, and uncertainty around the pace, scale and form of policies. They exist both between and within government departments, state-owned enterprises, academic research centres, civil society and trade unions. South Africa also faces negative impacts on economic development from an ineffective power grid has on economic development. Regular power outages result in mass labour layoffs, further adding to poverty growth. Despite having raised USD 8.5 billion donations during the COP26, the energy infrastructure continues to be weak, with regular power inefficiency; this reflects a lack of political commitment to investment to tackle the problem. The whole power ecosystem is poorly developed and poorly maintained, and insufficient to boost the national grids' reliability and effectiveness.

The South African energy ecosystem also suffers from a lack of skills in forecasting the energy needs of the country. The recurring power outages at Eskom could be a reflection of inadequate problem solving and critical thinking capacity. What South Africa needs now for a sustained turnaround and growth of its energy system, is an investment in power efficiency. This failure to invest in energy efficiency is avoidable, if the political leadership is willing to explore variable and flexible energy production routes and proper storage facilities.

In the same vein, the country must consider long term interventions that are less costly and yet impactful in boosting the energy ecosystem, such as upgrading the effectiveness of existing power plants to function optimally. The country also needs to consider scaling up production capacity and distribution systems to meet the demand. This calls for government to be creative and explore the green energy sector beyond solar and wind, to venture into water powered systems. This could contribute immensely to the whole energy sector value chain, open up the potential of safe and clean renewable energy across sectors at different levels. The AFOLU sector contributes significantly to Green House Gas emissions, especially the cattle industry. Yet although there is a theoretical commitment in policy, there has as yet been little effort to encourage land sector emissions reductions on the ground.

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Country template

Assessment of governance and climate action

India

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Glossary of terms

UJALA	Unnat Jyoti by Affordable LEDs for All (Advanced Lightning by Affordable LEDs for All)
Jal Shakti Abhiyan	Water Power Campaign (Water Conservation and Water Security Campaign)
Sahi Fasal	Right Crop (Campaign for Promoting Crops Requiring Less Water & Micro-Irrigation)
PM-KUSUM	Pradhan Mantri Kisan Urja Suraksha Evam Utthan Mahabhiyan (Prime Minister Mission for Farmers’ Energy Security and Development)
Madhya Pradesh Urja Vikas Nigam	Madhya Pradesh Power Development Corporation
PMUY	Pradhan Mantri Ujjwala Yojana (Prime Minister Plan on Clean Cooking Fuel)
PMAY	Pradhan Mantri Awas Yojana (Prime Minister Plan on Urban & Rural Housing)
DDUGY	Deendayal Udadyay Gram Jyoti Yojana (Deendayal Upadhyay Rural Electrification Scheme)

List of abbreviations

BCD	Basic Custom Duty
BEE	Bureau of Energy Efficiency
BRTS	Bus Rapid Transit System
COP	Conference of Parties
CO ₂	Carbon Dioxide
ECBC	Energy Conservation Building Code
EIA	Environmental Impact Assessment
ESCO	Energy Services Company
EV	Electric Vehicles
FAME	Faster Adoption and Manufacturing of Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas Emissions
GW	Gigawatt
GWh	Gigawatt Hours
INR	Indian Rupee
ISA	International Solar Alliance
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MW	Megawatt
NAPCC	National Action Plan on Climate Change
NBC	National Building Code
NDC	Nationally Determined Contributions
NEMMP	National Electric Mobility Mission Plan
NGO	Non-government Organisation
NGT	National Green Tribunal
NSEFI	National Solar Energy Federation of India
NSM	National Solar Mission
PAT	Perform, Achieve & Trade
PIL	Public Interest Litigation
PLI	Production Linked Incentive
PM	Particulate Matter
UNFCCC	United Nations Framework Convention on Climate Change

1. Context and characteristics of national governance

India, the world’s largest democracy, operates under a governance structure that upholds democratic norms, emphasises the rule of law, and encourages public participation in decision making processes.

It conducts regular elections at various levels (generally over a five year period at state and national level), including national, state, and local, allowing citizens to elect their representatives. Elections are overseen by the Election Commission of India, an independent body that ensures free and fair elections by enforcing a strict code of conduct and implementing necessary measures to prevent malpractices.

India’s legal system plays a crucial role in upholding governance and protecting citizens’ rights. The judiciary acts as an independent body, providing a platform for citizens, non-government organisations (NGOs), and private interests to challenge government decisions through the process of judicial review. The Supreme Court of India is the highest judicial authority and has the power to hear cases involving constitutional matters, including issues related to environmental protection.

In terms of environmental issues, citizens and NGOs have the right to approach the courts to seek redressal for violations or for enforcement of environmental laws. The principle of Public Interest Litigation (PIL) allows any citizen or organisation to file a case on behalf of those who cannot approach the court themselves, ensuring broader access to justice. The National Green Tribunal (NGT) has also been established as a specialised environmental court to deal with matters related to environmental protection and conservation. Formed in 2010 under the National Green Tribunal Act, it is a quasi-judicial body with powers similar to those of law enforcement agencies. A few studies have been conducted on the functioning and effectiveness of NGT:

- “National Green Tribunal and Environmental Justice in India”⁴⁶ is an empirical analysis of NGT judgements since its inception in October 2010 to December 2013;
- “National Green Tribunal of India-an observation from environmental judgements”⁴⁷ evaluates the 510 judgements by the Tribunal in 2016.

More recently, NGT has been clearing cases on a fast-track basis and usually imposing heavy fines⁴⁸, which have raised concerns over its effectiveness and credibility.⁴⁹

46 [National green tribunal and Environment Justice in India, 2014](#)

47 [National Green Tribunal of India-an observation from environmental judgements, 2018](#)

48 [States fined thousands of crores over waste- but how did NGT calculate the amount, 2022](#)

49 [National Green Tribunal is suddenly clearing a lot of cases, 2022](#)

India recognises the importance of public participation in decision-making processes beyond the democratic electoral system. While the democratic process allows citizens to elect their representatives, there are also provisions for public consultation on policy formulation and implementation. Various government departments and agencies conduct public consultations to seek feedback and input from stakeholders before finalising policies or projects that may have significant social or environmental impacts.

Furthermore, India encourages active participation of NGOs in the governance process. They often play a crucial role in advocating for social and environmental causes, influencing policy debates, and acting as watchdogs. They engage with the government through consultations, policy dialogues, and participation in advisory committees, ensuring diverse perspectives are considered. A recent example is the central government accepting recommendations on natural gas pricing from the Kirit Parikh Committee.⁵⁰ Several other advisory committees at the national and state levels, constituted of members from both the public and private sectors, and from civil society, have significantly contributed to policy-making decisions.⁵¹

The Constitution of India acknowledges the importance of environmental protection. Article 48-A of the Constitution mandates the state to protect and improve the environment and safeguard forests and wildlife. Additionally, Article 51-A(g) imposes a fundamental duty on every citizen to protect and improve the natural environment.

India has made significant international commitments to environmental governance. It is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, demonstrating its commitment to address climate change and reduce greenhouse gas (GHG) emissions.

India's governance structure reflects a commitment to democratic norms, free and fair elections, access to justice, public participation, and environmental governance. While there are ongoing challenges such as stark ideological differences between regional and national political parties, policy implementation hurdles in states ruled by political parties other than the ruling party at the centre, populist electoral manifestos etc., the country continues to evolve and strengthen its governance systems to ensure inclusive decision-making on environmental issues and sustainable development. Concerns have been expressed at the impact of changes such as the Citizenship (Amendment) Act 2019, which introduces a religious element to the conceptualisation of Indian citizenship, and other sectarian actions of the ruling Bharatiya Janata Party, leading the Economist Intelligence Unit to classify India as a “Flawed Democracy”

50 [Govt. approves Kirit Parikh panel recommendations on gas pricing, 2023](#)

51 [Central Advisory Committee for Electricity Regulations in India, State Advisory Committee for Electricity Regulations in Rajasthan, Energy Transition Advisory Committee](#)

in its 2020 Democracy Index. However, these developments have little direct impact on environmental rights.

2. National climate policymaking

India, as a party to the UNFCCC, plays an active role in global climate negotiations and has committed to various international agreements and protocols, including the Paris Agreement. India submitted its Nationally Determined Contribution (NDC) to the Paris Agreement in 2015, outlining its climate targets and commitments. The NDC was revised later at the Conference of Parties (COP 26) held at Glasgow, United Kingdom in 2021 to reflect the country’s drive to mitigate and adapt to climate change and become net-zero by 2070.

India’s updated NDC has a balanced and comprehensive approach to climate action, considering its developmental imperatives and the need for sustainable growth. The NDC’s key objectives include reducing the emissions intensity of its gross domestic product (GDP) by 45% by 2030 compared to 2005 levels, achieving about 50% cumulative electricity generation capacity from non-fossil fuel-based energy sources by 2030, and creating an additional carbon sink of 2.5-3 billion tonnes of CO₂ equivalent through additional forest and tree cover.

The Indian government is also propagating a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for ‘LIFE’- ‘Lifestyle for Environment’ as a key to combating climate change. The NDC also highlights the importance of climate finance, technology transfer, and capacity-building support from developed countries to aid India’s mitigation and adaptation efforts.

The NDC also provides a roadmap for India’s transition to clean energy in the decade of 2021-30. To implement these commitments, India has developed a range of national policies and initiatives. The main sectors relevant to climate emissions in India include energy, industry, transport, agriculture, and forestry. The country has adopted a sector-specific approach to address mitigation in these sectors. In the energy sector, India aims to expand renewable energy capacity, enhance energy efficiency, and promote clean technologies. The government has launched several initiatives such as the National Solar Mission (NSM), the Green Energy Corridor Project, Production Linked Incentive (PLI), and the UJALA program to accelerate renewable energy deployment, manufacturing and energy efficiency measures.

In the industry sector, India has introduced measures to improve energy efficiency, promote clean technologies, and encourage industrial symbiosis. A Green Hydrogen Mission with the overall objective of making India the global hub for production, usage and export of green hydrogen by developing 5 million tonnes/year manufacturing capacity

by 2030 is supported by INR 197.5 billion (~\$2.39 billion) of government financing. The Perform, Achieve, and Trade (PAT) scheme, for instance, sets energy efficiency targets for energy-intensive industries and facilitates the trading of energy-saving certificates. In 2022, the Indian Parliament passed the Energy Conservation Amendment Bill (2022) introducing provisions for establishing a carbon trading market and mandatory use of renewable energy by designated consumers.

In the transport sector, policies focus on promoting electric mobility, improving fuel efficiency standards, and expanding public transportation infrastructure. Almost all Indian states have notified their electric vehicle (EV) policies which are aligned with the national targets of new EV sales penetration of 30% for private cars, 70% for commercial cars, 40% for buses and 80% for two and three wheelers by 2030.

These climate driven policies in different sectors have generated a good market momentum by attracting investors and their implementation is in different stages of development. But the scale and speed at which these policies need to be implemented for achieving the targets set for 2030 are negatively impacted by several socio-economic/political factors such as: adopting a protectionist approach to support domestic manufacturing, which in turn creates a price volatile market; a lack of policy convergence at state and central level; a highly but poorly regulated energy sector; subsidised electricity; and a lack of coordination between inter-ministerial departments at both central and state level. As a consequence, India often finds itself lagging behind its targets in the absence of a favourable policy and regulatory framework essential for meeting those targets, despite being one of the largest installers of renewable energy in recent years.

For adaptation strategies, India has formulated a National Action Plan on Climate Change (NAPCC) that addresses various aspects of climate resilience and adaptation. The plan includes eight missions covering areas such as agriculture, water, forestry, and health. For instance, the National Water Mission aims to improve water resource management and enhance the resilience of water supply systems. The National Mission for Sustainable Agriculture focuses on sustainable farming practices and climate-resilient agriculture.

Launched in 2011, the National Water Mission has identified specific goals of developing a comprehensive water data base in the public domain; assessment of the impact of climate change on water resources; promotion of citizen and state actions for water conservation, augmentation and preservation; and has focused attention to vulnerable areas including over-exploited areas; Increasing water use efficiency by 20%; and promotion of basin level integrated water resources management.⁵²

52 [National Water Mission](#)

State specific action plans have been designed and accordingly funds have been allocated for different schemes which are in different stages of implementation. Additionally, campaigns like Jal Shakti Abhiyan⁵³, Sahi Fasal⁵⁴, etc. and capacity building programmes have been undertaken under the mission. A Bureau of Water Use Efficiency has also been set up with the objective of conservation of water, minimising wastage and ensuring its more equitable distribution both across and within states through integrated water resources development and management.

A National Mission for Sustainable Agriculture was launched in 2010 with the objectives of adopting climate resilient agricultural practices; natural resource conservation; adopting soil health management practices; capacity building of farmers; establishing effective interdepartmental coordination; and executing pilot projects on improving productivity of rainfed farming.

These objectives were formulated in conjunction with other similar programmes like National Mission on Agriculture Extension & Technology, National Food Security Mission, and National Initiative for Climate Resilient Agriculture etc., in the domain of climate change adaptation and mitigation measures.

Programmes like the National Bamboo Mission, the Mission on Agroforestry, and the Rainfed Area Development are some of the initiatives undertaken under the National Mission for Sustainable Agriculture and have been benefitting farmers across different Indian states.

Public and civil society engagement in climate policymaking in India is significant. India has a vibrant civil society and a thriving democracy that allows for public debate and engagement on climate change. Various non-governmental organisations, research institutions, and grassroots movements actively contribute to climate policy discussions and advocate for sustainable practices.

While there may be differing perspectives among political parties, there is a general recognition of the need for climate action across the political spectrum. Different parties may recognise different aspects of climate policy, but overall, the importance of addressing climate change is acknowledged and reflected in national policies and strategies.

53 [Jal Shakti Abhiyan: Catch the Rain](#) is a nationwide campaign focusing on saving and conserving rainwater during the pre-monsoon and monsoon periods in India, covering both urban and rural areas in all the districts in the country. The campaign will remain operational from March 2023 to November 2030.

54 [The Sahi Fasal campaign was launched by National Water Mission in November 219 to nudge farmers in the water stressed areas to grow crops which are not water intensive, but use water very efficiently; and are economically remunerative; are healthy and nutritious; suited to the agro-climatic-hydro characteristics of the area; and are environmentally friendly.](#)

3. Sectoral information

In order to examine how the political structures identified in section 1 above, and the national climate policymaking outlined in section 2 above, affect decision-making in relevant sectors, we have looked in each country at how decisions are made on transport infrastructure, renewable energy infrastructure, and energy efficiency/energy supply in domestic housing. The following sections address each of these for India.

3.1 Transport infrastructure

India’s transport sector plays a significant role in the country’s economic growth, but it also poses challenges in terms of climate change mitigation. Road transportation accounts for almost 15% of total carbon emissions in India.⁵⁵ India’s approach to transport planning and investment, in recent years, has shifted to a more climate inclined objective. The country now acknowledges the importance of addressing climate change in its national policy statements on transport and infrastructure investment. The National Electric Mobility Mission Plan (NEMMP) emphasises sustainable transport and reducing greenhouse gas (GHG) emissions. The Plan promotes the adoption of electric and low-carbon vehicles, the development of efficient public transportation systems, and the integration of non-motorised transport modes.

The Faster Adoption and Manufacturing of Electric Vehicle (FAME) I & II programmes, with a combined budgetary outlay of INR 105.3 billion (~\$1.27 billion), were launched in 2015 and 2019 respectively under NEMMP for promoting EV in India by providing subsidies for 2-3-4 wheelers and buses. FAME I was functional till 2019 and more than 278,000 EVs were supported with an incentive of INR 3.4 billion (~\$42 million). In addition, 465 e-buses were sanctioned to various states under the scheme.⁵⁶

FAME II with a budgetary outlay of INR 100 billion (~\$1.2 billion) aims to support a million e-two wheelers, half a million e-three wheelers, 550,000 e-four wheelers, and 7,000 e-buses. So far, more than 644,000 e-vehicles have been sold with the subsidy support from FAME II resulting in carbon reduction of 1,367 tonnes per day.⁵⁷

The PLI scheme for Advanced Chemistry Cell Battery Storage envisages ~95 GWh of battery storage manufacturing capacity by investing INR 181 billion (~\$2.2 billion) in the form of incentives to the industry.

While these policy statements acknowledge climate mitigation issues, further efforts are needed to ensure their consistent implementation. India’s diverse transport sector requires more focused initiatives to align

55 [CO2 emissions from India energy sector, 2019](#)

56 [FAME India Scheme](#)

57 [FAME India Scheme Phase II](#)

infrastructure investments with climate objectives comprehensively. Additionally, integrating renewable energy sources into transport infrastructure remains a crucial area requiring attention.

Major infrastructure investments in India require an environmental impact assessment (EIA) under the Environment Impact Assessment Notification, 2006. However, the implementation of this requirement faces challenges. In some cases, there are delays, inadequate enforcement, and insufficient scrutiny of EIAs. This inconsistency undermines the effectiveness of the EIA process in ensuring environmentally sustainable infrastructure development.

Additional efforts are required to enhance the rigor and transparency of the EIA process. It will be important to strengthen compliance mechanisms and ensure that effective mitigation measures are in place to address climate change concerns.

India’s legal framework mandates public consultation for certain infrastructure projects, but the extent and effectiveness of public participation vary. Limited awareness, insufficient time for consultation, and language barriers often hinder meaningful engagement.

Additionally, infrastructure plans in India often face delays due to various factors, including public consultation, legal challenges, lack of finance, and bureaucratic processes. These delays impact climate objectives by postponing the deployment of low-carbon alternatives and the reduction of emissions from transportation.

Still, a commendable example of an infrastructure project that effectively integrates climate concerns can be Mumbai Metro Line 3. The project undertaken by Mumbai Metro rail Corporation was conceptualised in 2008 and conceived to address Mumbai’s growing transportation needs, reduce congestion, and provide a sustainable public transport option. The construction started in 2016, and the project is currently in progress. The project’s planning and design prioritise climate mitigation measures. These include energy-efficient trains, the use of regenerative braking technology, and the incorporation of renewable energy sources for station operations.

While the project is still ongoing, it is expected to reduce GHG emissions significantly by promoting a shift from private vehicles to low-carbon mass transit. Once completed, Mumbai Metro Line 3 is projected to reduce 261,000 tonnes of CO₂ emissions annually.⁵⁸

Several campaigns to promote public transportation, safe public transport for women, and campaigns to promote walking & cycling have also been initiated at central and state level on regular intervals with support from civil society organisations/NGOs.

Bus Rapid Transit System (BRTS) is another initiative taken up by the

⁵⁸ [MMRCL Sets Ambitious Target to Complete Mumbai’s First Underground Metro project by June 2024](#)



transport departments in several states to improve the efficiency of public transport within cities. A BRTS includes dedicated lanes exclusively for buses along with several other prominent features like accessible station spaces, priority to BRT buses at intersection, IT enabled boarding and ticketing processes, etc.

The faster movement of buses helps in reducing travelling time and the cost-effective fares ensure that service provided is adopted by large number of masses. The preference of commuters to adopt BRTS over private or any other modes of commute also contributes towards carbon emission reduction. Ahmedabad, Amritsar, Pune, Raipur, Jaipur, Bhopal, Jodhpur, Indore, Surat, Vishakhapatnam, Vijaywada are among the cities where BRTS has been deployed and functioning successfully while several other cities like Mumbai, Chennai etc. are in the process of implementing a BRTS.

India's approach to transport planning and investment shows progress in addressing climate policy objectives. National policy statements highlight the importance of sustainable transport and reducing emissions. Still, further efforts are needed to ensure consistent implementation. EIAs should be rigorously enforced, public consultation processes improved, and implementation expedited.

3.2 Renewable energy infrastructure

India's commitment to renewable energy plays a crucial role in achieving its climate policy objectives. The NAPCC and the National Electricity Policy (NEP) recognise the importance of renewable energy in reducing GHG emissions. The policies they outline promote the expansion of renewable energy capacity, including wind, solar, hydro, and bioenergy, to achieve national climate objectives.

The country has witnessed significant investments in renewable energy in recent years and has made substantial progress in solar and wind

energy installations, contributing to a more diversified and cleaner energy mix. India stands fourth globally in renewable energy installed capacity and was ranked third globally for total renewable addition in 2021 in the Renewable 2022 Global Status Report by REN21.⁵⁹

India has set ambitious targets to increase the share of renewable energy in its total energy mix. The country aims to achieve 450 GW of renewable energy capacity by 2030, with 280 GW coming from solar power, and 140 GW from wind power. This is aligned with meeting 50% of the energy requirement from renewable energy by 2030, with estimated power demands reaching 820 GW.⁶⁰ The National Electricity Plan, released in May 2023 by Central Electricity Authority, also projects capacity addition requirement of 212 GW between 2022 and 2027. This will include 32 GW from conventional energy (Coal-25.7 GW and Nuclear-6.3 GW) and 180 GW from renewables (solar-131 GW, wind-32.5 GW, large hydro-10.5 GW, and other sources like biomass, small Hydro and pumped storage projects). Additionally, the battery storage requirement would be 8.7 GW/ 34.7 GWh during this period.⁶¹

However, the current penetration of renewable energy in the total power supply stands at 20% (including large hydro), despite having a share of 41% in total installed capacity. Thermal power, on the other hand, has 79% penetration in total power supply with a share of 57% in installed power capacity.⁶² Utility scale battery storage solutions would be essential for India to unlock the potential of renewable energy and create the conditions for meeting its net zero aspirations.

The NSM launched in 2010 has been the key driver for the growth of solar energy in India by defining targets, introducing competitive bidding for projects, generation based incentives, and exemptions on several charges associated with generation and transmission of electricity. As of April 2023, 67 GW of utility scale solar projects have been installed in India under different schemes under the NSM.⁶³

Under the NSM, the government also facilitates the development of large-scale solar parks and provided benefits to developers through rebate in taxes, land at concessional rates, incentives for manufacturing renewable energy equipment within parks etc. The solar park programme launched in 2014 was initially for setting up 25 parks with cumulative capacity of 20 GW but was later enhanced to 40 GW in 2017. Bhadla Solar Park, the world’s largest solar park, in the state of Rajasthan was built under the solar park scheme. The park has over 2 GW of solar installations and capacity expansion plans are in works.

Solar energy in India is promoted through rooftop installations as well.

59 [Renewables 2022 Global Status Report](#)

60 [Power Generation Capacity to hit 820 GW by 2030](#)

61 [National Electricity Plan, 2023](#)

62 [Renewable Energy Generation Report-April 2023, All India Installed Capacity-April 2023](#)

63 [State-wise Installed Capacity of Renewable Power](#)

But despite subsidies to consumers the market has not picked up yet, and is largely limited to the commercial and industrial sectors. The target of 40 GW of rooftop solar energy by 2022 has not been met; only 9 GW of capacity had been installed by April 2023.

The International Solar Alliance (ISA) is another example of India’s commitment to renewable energy especially solar. The alliance was conceived in 2015 as a joint effort by India and France to mobilise efforts against climate change through deployment of solar energy solutions. At present, 123 nations are part of this alliance.

India is also keen on the development of on-shore and off-shore wind power, hydro power, biomass cogeneration and waste to energy and more recently on nuclear power to expedite its commitments towards increased renewable energy mix in power generation. The wind power capacity in India, at the end of April 2023, stands at ~43 GW. To take this capacity to 140 GW by 20230, several policies have been launched in India.

The Policy for Repowering of the Wind Power projects, launched in 2016, aims to upgrade wind turbines below the capacity of 1 MW.⁶⁴ An estimated 3 GW of wind capacity in India is from turbines of 500 kW or below thus making this policy a much needed effort for optimisation of assets.

The National Offshore Wind Energy Policy, launched in 2015, looks to explore and promote deployment of offshore wind farms in the Exclusive Economic Zones through suitable incentives.⁶⁵

National Wind Solar Hybrid Policy was launched in 2018 to tackle the low level of renewable energy and achieve grid stability and an optimal utilisation of transmission infrastructure and land. As a result, almost all new tenders issued by the nodal agencies for development of renewable energy are now either solar, wind or hybrid projects with battery storage requirements. Nodal agencies are public-sector undertakings and ministries appointed by central and state governments to formulate and execute policies in energy and other domains. For example, Solar Energy Corporation of India is the nodal agency of Indian government for implementing NSM. The role of a nodal agency varies on the basis of government directives and generally includes developing policy and regulatory frameworks, financing, project execution, and campaigns, and other activities as per the requirements. This mechanism extends to all states as well.⁶⁶

As of April 2023, the installed capacity of hydropower in India stands at ~47 GW and is expected to reach 70 GW by 2030. India is also looking at pumped hydro projects as a battery storage option and guidelines for

⁶⁴ [Policy for Repowering of Wind Power Projects](#), 2016

⁶⁵ [National Offshore Wind Energy Policy, 2015](#)

⁶⁶ [SECI named nodal agency for setting up 2.5 GW of wind-solar projects](#)

promoting pumped storage projects were issued by Ministry of Power in April 2023.⁶⁷ All hydropower projects in India now fall under the category of renewable energy projects (earlier it was limited to small hydro projects of up to 25 MW capacities⁶⁸). In 2019, the government of India declared large hydro projects as renewable energy sources against the backdrop of:

- Unrealised hydropower potential
- Water security, irrigation and flood moderation benefits
- Socio-economic development by creating employment and boosting tourism
- The valuable role of hydropower as a balancing source for intermittent sources of solar and wind due to its unique features like quick ramping, black start, reactive absorption etc.

However, power distribution companies were reluctant to sign power purchase agreements for hydro projects due to higher tariffs, especially in the initial years. The reason for this higher tariff was the offloading of the cost of flood moderation and enabling infrastructure into the total project cost. Promoting hydropower as renewable energy would make it eligible for incentives provided to developers for developing renewable energy projects, thus attracting more investment and consequently absorbing the additional cost of flood moderation and enabling infrastructure. This would also mean having more alternatives for fulfilling the country’s NDC in an effective and timely manner.

Different central and state programmes on biomass generation and waste to energy also contributed towards development of a clean energy economy. As of April 2023, cumulative capacity under such initiatives stands at ~11 GW.

All the mentioned policies and guidelines were introduced after extensive public and civil society consultation, but these consultations are limited to policies and regulations only and do not extend to specific renewable energy infrastructure projects. Renewable energy products including solar, wind, biomass, small hydro (up to 25 MW) and waste to energy (up to 15 MW) do not require an EIA. The increasing number of large scale renewable projects, especially hydro, indicates that there is a need to conduct such studies to ensure that there is no adverse impact on local ecological systems.

Despite the EIAs not being required, there are instances when renewable energy projects faced several delays due to regulatory and financial hurdles. In April 2022, a Basic Custom Duty (BCD) of 40% on solar modules and 25% on solar cells was applied. This was done to protect domestic manufacturers from competing with low-cost imports mainly from China, with 80-85% of solar panels imported from overseas. According to the National Solar Energy Federation of India (NSEFI), an umbrella organisation of all solar energy stakeholders

67 [Guidelines to promote development of Pump Storage Projects, 2023](#)

68 [Cabinet approves Measures to promote Hydro Power Sector](#)

of India, this move put 15 GW of solar projects at risk with significant delays in commissioning as well as an increase in the unit cost of energy production.⁶⁹

The Pradhan Mantri Kisan Urja Suraksha Evam Utthan Yojana (PM-KUSUM) is another scheme that is ambitious but has failed in execution. The scheme was launched in 2019 with the aim of installing 10 GW of decentralised solar energy by farmers to increase and diversify their increased income and improve energy security. But the scheme’s performance has been poor due to the inability of farmers to secure loans for project development. It proposed that 70% of financing should come through banks and the remaining 30% from farmers, but most farmers (generally an economically weaker community) interested in installing solar plant found it difficult to secure loans due to poor credit ratings, and also to provide the rest through self-financing.

On the contrary, the Rewa Ultra Mega Solar Power Project⁷⁰ can be cited as an example that reflects India’s effort towards developing a clean energy ecosystem as well as seamless execution without delays due to regulatory hurdles and organisational structure.

The construction for the 750 MW project in the Rewa district of Madhya Pradesh started in late 2015 and started commercial production of electricity in July 2018. The total 750 MW capacity was commissioned in January 2020. The project is estimated to reduce 1.5 million tonnes of carbon emissions per year.⁷¹

A joint venture between Madhya Pradesh Urja Vikas Nigam and Solar Energy Corporation of India was formed to oversee the development of the project. The success of the project enabled the company to develop solar parks in other areas of Madhya Pradesh.

This was a breakthrough renewable energy project in that it was able to:

- Break the grid parity barrier (the tariffs for this project are at par with power generation from coal)
- Supply power to an institutional customer outside the state – in this case the Delhi Metro Rail Corporation
- Get a concessional loan from the World Bank for development of internal evacuation infrastructure
- Introduce a three-tier payment security mechanism to ensure regular payments from distribution companies to the developers
- Introduce the concept of optimum scheduling to meet almost 60% of the day time energy requirement of Delhi Metro Rail Corporation

69 [15 GW Solar Projects risk impact from BCD on April 2022, Says NSEFI](#)

70 [Rewa Ultra Mega Solar](#)

71 [Rewa project will reduce carbon emission equivalent to approx. 15 lakh ton of CO2 per year](#)

3.3 Energy efficiency/ energy supply in the residential sector

The Pradhan Mantri Ujjwala Yojana (PMUY) is a flagship social welfare scheme launched by the Government of India in May 2016. The primary objective of PMUY is to provide clean cooking fuel to women from economically disadvantaged households. The scheme aims to replace traditional cooking fuels, such as firewood and coal, with cleaner and more efficient liquefied petroleum gas (LPG). More than 95 million LPG connections have been issued under this scheme which has taken LPG coverage in India from 62% in 2016 to 99% in 2021.⁷² According to a report by the World Resource Institute, PMUY prevented 150,000 pollution related deaths in 2019. It also helped in avoiding 1.8 million tonnes of fine particulate matter (PM2.5) emissions in the same year.⁷³ The Energy Conservation Building Code (ECBC)⁷⁴ and the National Building Code (NBC)⁷⁵ provide guidelines and standards for energy-efficient design, construction, and operation of buildings. These policies address climate issues by promoting improved insulation, more efficient cooling systems, and energy-efficient appliances in existing and new buildings. The Pradhan Mantri Awas Yojana (PMAY), NSM, and Smart Cities Mission are some other examples of policies targeting energy efficiency in housing sector and addressing climate concerns.

The ECBC, initially launched in 2007 by the Ministry of Power, was updated in 2017 with additional priorities for renewable energy integration, ease of compliance, and building design strategies. The ECBC primarily focuses on energy efficiency, thereby contributing to climate change mitigation by reducing energy consumption and associated carbon emissions. It does not explicitly mention climate mitigation as an objective, although climate adaptation issues are addressed.

The NBC, launched in 2016 by the Bureau of Indian Standards, provides guidelines and standards for the design, construction, and operation of buildings in India. It includes provisions for energy efficiency, thermal insulation, and renewable energy integration in building design. While the NBC primarily focuses on technical aspects, it contributes to climate change mitigation by promoting energy-efficient building practices and reducing greenhouse gas emissions associated with energy consumption in the housing sector. As with the ECBC, it does not explicitly mention climate mitigation as an objective.

The PMAY⁷⁶, launched in 2015, is a government initiative aimed at providing affordable housing for all in urban and rural areas. While

72 [Pradhan Mantri Ujjwala Yojana \(Prime Minister Plan on Clean Cooking Fuel\)](#)

73 [PM Ujjwala Yojana reduced air pollution deaths by 13 per cent, prevented over 1.5 lakh deaths in 2019: Study](#)

74 [Energy Conservation Building Code, 2017](#)

75 [National Building Code, 2016](#)

76 [Pradhan Mantri Awas Yojana \(Prime Minister Plan on Urban & Rural Housing\)](#)



the primary focus of PMAY is on housing accessibility and affordability, it also encourages the use of environmentally sustainable and energy-efficient construction practices. The scheme promotes the adoption of green building concepts, including energy-efficient appliances, rainwater harvesting, and waste management systems, thus indirectly addressing climate concerns.

The NSM is a comprehensive initiative by the Government of India that aims to promote the deployment of solar energy across various sectors, including the housing sector. It encourages the integration of solar power systems, such as rooftop solar panels, in residential buildings to reduce dependence on fossil fuels and mitigate climate change impacts. The NSM contributes directly to addressing climate issues by promoting renewable energy generation in the domestic housing sector.

The Smart Cities Mission, launched in 2015, aims to develop sustainable and energy-efficient cities in India. While not specific to the housing sector, it includes provisions for sustainable buildings and infrastructure. The mission promotes the use of smart technologies, energy-efficient appliances, and waste management systems in urban areas, addressing climate issues through reduced energy consumption and environmental impact.

The Bureau of Energy Efficiency (BEE), under the Ministry of Power, Government of India, has implemented two significant initiatives aimed at promoting energy efficiency and sustainability in housing sector. These initiatives are the Star Labelling Programme and the UJALA Scheme.

The Star Labelling Programme⁷⁷ is a labelling activity that aims to inform consumers about the energy efficiency levels of appliances and encourage them to make energy-efficient choices. Under this program, various appliances such as refrigerators, air conditioners, televisions, and fans are awarded star ratings based on their energy performance. The higher the star rating, the more energy-efficient the appliance is, indicating lower energy consumption and reduced environmental impact. The programme helps consumers make informed decisions while purchasing appliances and motivates manufacturers to develop and produce energy-efficient products. The Star Labelling Programme has played a crucial role in promoting energy efficient products in India. According to an impact assessment report by CLASP, an international non-profit organisation, the estimated energy savings in 2012 from the use of energy efficient appliances were over 5,954 GWh, leading to a total avoided capacity of 4.8 GW and GHG reduction of 5.5 million tonnes of CO₂ from eight product categories. Consumer awareness of energy efficient products also increased to 63% in 2014 from 33% in 2010.⁷⁸

The UJALA Scheme is another initiative by the Bureau of Energy Efficiency. Launched in 2015, the programme is executed by Energy Efficiency Services Limited, a state run Energy Services Company (ESCO). It focuses on energy-efficient lighting solutions by replacing inefficient incandescent bulbs with energy-saving LED bulbs. The scheme aims to provide LED bulbs, tube lights, and energy efficient fans at affordable prices to households across the country, thereby reducing electricity bills and contributing to energy conservation. The UJALA Scheme has been highly successful, resulting in significant energy savings and helping millions of household's transition to more sustainable lighting options. Still ongoing, more than 368 million LED bulbs, 7 million LED tube lights, and 2 million energy-efficient fans have been distributed across different states resulting in an estimated carbon emission reduction of 39 million tonnes per year.⁷⁹

Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) is a flagship scheme of the Government of India aimed at providing electricity access to rural areas and improving the quality and reliability of power supply. The scheme was launched in July 2015 with the objective of electrifying all un-electrified villages and providing 24x7 power supply to rural households, agricultural consumers, and rural industries. The key components of the scheme included: village electrification; feeder separation; strengthening of power distribution infrastructure;

77 [BEE Standards & Labelling Programme](#)

78 [Impact Assessment of BEE's Standard & Labeling Program in India](#)

79 [Unnat Jyoti by Affordable LEDs for All \(Advanced Lightning by Affordable LEDs for All\)](#)

and improving metering and billing efficiency. More than 28 million households were electrified under the DDUGJY scheme to achieve the target of 100% electrification of rural households.⁸⁰

Generally, these schemes/ programmes/ campaigns are executed over a span of three-five years in tranches. After the implementation of each tranche, stakeholder consultations within government agencies and NGOs/ civil society organisations are carried out to formulate strategies for the next tranche, and separate guidelines are issued by the nodal agencies. These are usually related to budgetary outlay, challenges faced in the execution of previous tranche of the scheme, regulatory reforms for ease of implementation etc.

Additionally, Impact Assessment Studies are carried out by nodal agencies on an annual basis to understand the actual effectiveness. The BEE publishes reports on the Impact of Energy Efficiency Measures⁸¹ along with other relevant studies⁸² to assess the impact of current initiatives and ways to improve them further in the next cycle.

The Indian government has shown commitment to improving energy supply in the domestic housing sector, with a focus on energy efficiency, replacement and renewal of existing supply, and energy access to rural or marginalised communities. Current national policy statements address climate issues, and specific campaigns and initiatives have been implemented to enhance energy efficiency and promote sustainable energy use.

However, more efforts are needed to ensure comprehensive adoption of energy-efficient practices and the integration of renewable energy sources. This includes enhancing policy enforcement, expanding financing options, and increasing awareness among homeowners and builders. It is essential to prioritise the rural and marginalised communities to bridge the energy supply gap and ensure equitable access to clean energy sources.

80 [Household Electrification Status: All India](#)

81 [Impact of Energy Efficiency Measures 2020:21](#)

82 [BEE Energy Efficiency Measures](#)

Summary of findings

India, with its diverse population, unique challenges, and growing economy, plays a crucial role in the global efforts to combat climate change. The political structure of India, characterised by a federal parliamentary system, has a significant impact on the development and implementation of climate policy within the country.

The federal structure grants significant powers to individual states, allowing them to formulate and implement policies within their jurisdictions. While this promotes flexibility and tailoring of climate policies to local needs, it can also result in variations in policy priorities and implementation capacities across states. Coordinating climate action between the central government and states is therefore crucial to achieve national climate goals.

The political structure is characterised by a multi-party system, where political parties compete for power at both the national and state levels. Climate policy development requires collaboration and consensus-building among different political parties, which can sometimes lead to policy fragmentation or delays. The need for broad-based political support for climate initiatives can influence the pace and effectiveness of policy implementation.

Central government holds significant authority in shaping India’s climate policies. The political will and commitment of the central leadership play a crucial role in the setting of ambitious climate targets, in mobilising resources, and in coordinating national efforts.

Climate change has not yet become an important issue in national and state level elections, and political parties do not compete on the basis of climate agendas. But India’s political structure provides space for civil society organisations, NGOs, and citizens to engage in policy advocacy and influence the climate agenda. Public opinion and societal awareness of climate change can put pressure on ruling parties to prioritise climate action and address environmental concerns.

This structure is reflected in and has a direct impact on the formulation and implementation of policies on sustainable transport, renewable energy, and energy efficiency. The central government, in collaboration with state governments, develops strategies to promote sustainable and low-carbon transportation systems, renewable energy to reduce reliance on fossil and cut carbon emissions from coal sector, and energy efficiency measures to reduce carbon emissions through demand side interventions.

In the transportation sector, central government’s policy initiatives, such as the FAME scheme, aim to accelerate the adoption of EVs in India. But the implementation of EV-related policies and infrastructure

development relies heavily on the cooperation and support of individual states. Differences in financial capabilities, infrastructure readiness, and local priorities can impact the pace and effectiveness of EV adoption across the country. These differences often disrupt the flow of finances.

Policies promoting sustainable public transportation systems, such as BRTS, require collaboration between central and state governments. While the central government provides funding and policy guidance, state governments play a crucial role in implementing and managing public transportation infrastructure. Varying levels of commitment, resources, and political will influence the success of such initiatives.

Similarly, the central government formulates national policies for renewable energy and sets targets for capacity addition. This is followed up states by introducing their own policy. The implementation of these policies largely rests with state governments, as they are responsible for land allocation, power purchase agreements, and regulatory approvals. The incentive mechanisms may also vary at central and state level and also within different states depending on state policies, resulting in a non-uniform development across regions. The inefficiency of the power distribution companies of some states has also forced central agencies to intervene in the areas of power purchase and sale. Developers of solar power also find it more convenient to have agreements with central agencies rather than with state-level entities.

Government departments at central level set energy efficiency standards and establish regulatory bodies to monitor compliance, but the enforcement and implementation of these standards largely fall under the purview of state governments. Differences in administrative capacity, monitoring mechanisms, and commitment to enforcement can influence the effectiveness of energy efficiency policies. Central government also provides financial incentives, subsidies, and support for energy efficiency initiatives. But the implementation of these incentives and programs depends on the cooperation and participation of state governments. Variations in state-level budgetary priorities, administrative capacity, and policy alignment can impact the reach and effectiveness of energy efficiency schemes.

Given these differences, policy convergence at central and state level seems to be the biggest challenge for implementing policies in different sectors that effectively address the challenge of climate change at a national and sub-national level. Here, civil society organisations/ NGO can play a crucial role in ensuring that central and state government's motives are well aligned. This can be achieved probably in two ways:

- i) Assigning a civil society organisation/ NGO or a group of such organisations within each state as an agency to ensure that state climate policies are well aligned with the national policy and are executed in a timely way;

ii) Creation of state level think tanks in line with the government backed think tank of Niti Aayog (the former Planning Commission of India) to ensure that policies are formulated by taking account of states’ interests.

Further, to maximise civil society’s positive influence on climate ambition and delivery within India’s political structure, the following suggestions can be considered:

i) Strengthening partnerships: Civil society organisations can collaborate with government agencies, research institutions, and other stakeholders to develop evidence-based policy recommendations and foster inclusive decision-making processes.

ii) Building public awareness: Civil society can raise awareness about the importance of climate action and the benefits of sustainable practices, mobilising public support for ambitious climate policies.

iii) Advocacy and engagement: Civil society organisations can actively engage in advocacy, lobbying for stronger climate policies, and ensuring their effective implementation. This includes engaging with policymakers, conducting research, and organising public campaigns to create momentum for change.

iv) Strengthening legal mechanisms: Civil society can utilise legal avenues to hold governments accountable for climate commitments and advocate for the development and enforcement of robust environmental laws. However, there is as yet little experience of successful legal challenge to government policies.

v) Promoting capacity-building: Civil society can facilitate capacity-building initiatives, empowering communities and individuals with knowledge and skills to actively participate in climate policy discussions and decision-making processes.

Monitoring and evaluation of progress in execution and post implementation of policies is another area where prompt action can enhance the effectiveness of interventions related to climate change. These can also ensure that regulatory frameworks are simplified for a better ease of doing business within private and public markets.

India has put renewable energy, electric mobility, and energy efficiency as the top of its agenda for achieving net-zero goals by 2070. Its policies across different sectors to address climate change mitigation and adaptation are also well in place. Being a developing country, it needs to align aspirations for economic growth with ambitions for a sustainable economy in a just manner. A people-centric approach

backed by synergies between central and state governments and agencies; and effective coordination with civil society organisations to eliminate bottlenecks in existing public-private framework can enhance the scale and speed essential for achieving the climate goals.

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