Policy brief
December 2016

ODI Insights

Aligning objectives

International climate commitments and national energy strategies

Andrew Scott
Laurie Van der Burg
Sejal Patel

Parties to the Paris Agreement have pledged actions to tackle climate change in their Nationally Determined Contributions (NDCs), but these do not add up to enough to avoid dangerous levels of climate change. For that, national energy systems must be decarbonised by the end of the century.

Therefore, the effectiveness of national energy policy will be decisive in achieving the objectives of both the Paris Agreement and the SDGs. However, NDCs do not all include action to reduce energy-related emissions, do not necessarily address emissions from all energy sources and may not be specific about the action that is pledged. It is also unclear whether these pledges are coherent with existing national energy policies.

We recommend the following actions to governments:

1. **Include energy emission reduction objectives in all NDCs:** All countries will need to decarbonise their energy systems and be able to contribute energy emission reductions.
2. **Align national energy sector plans, national SDG energy targets and NDCs:** Increasing the ambition of NDCs could be achieved by including all planned actions that contribute to the mitigation of energy emissions. Targets in NDCs should be based on planned changes in the production and consumption of energy from all sources.
3. **Provide international support for low-carbon energy planning in developing countries:** Their energy plans and NDCs need to be revised to help reduce energy-related emissions.

The issue/context

Following the Paris Agreement's entry into force on 4 November 2016, attention is now focused on its implementation. Delivery of the actions pledged by national governments in their NDCs will form a critical part of this. Analysis of the NDCs to date has addressed two main questions:

- Will the emission reductions pledged be enough in aggregate to put the world on a pathway to the well-below 2°C goal? (Analysis has indicated that this is not the case.)
- What is the level of investment required to deliver the NDCs, and how this might be financed? (This remains a matter of discussion.)

If the well-below 2°C goal is to be achieved, a rapid reduction in emissions of greenhouse gases from the consumption and production of energy will be necessary. In the long-term, the complete decarbonisation of global energy systems will be required. To transition to lower-carbon energy systems, renewable energy sources (hydro, solar, wind, bioenergy and geothermal) need to replace carbon-intensive sources (coal, oil and natural gas), and the efficiency of energy production and consumption must be improved. However, the NDCs of many countries do not specifically include the reduction – or avoidance – of energy-related emissions.

Parallel to the process for implementing the Paris Agreement, international development organisations are focused on the implementation of the Sustainable Development Goals (SDGs), adopted by the UN General Assembly in 2015. The SDGs include the following targets for 2030:

- ensure universal access to affordable, reliable and modern energy services
- increase the share of renewables in the global energy mix
- double the rate of improvement in energy efficiency
- rationalise inefficient fossil-fuel subsidies.

The above are all directly relevant to the climate change goal of the Paris Agreement. At the national level, achieving the energy objectives of the SDGs can contribute to the delivery of NDCs, and vice versa.

The effectiveness of national energy policies will be decisive for achieving the objectives of both the Paris Agreement and the SDGs. Links between NDCs and national development objectives have mainly been considered from the perspective of emission reductions and climate finance – climate change objectives – so far. There has been little consideration of countries' existing energy sector plans and the extent to which these are aligned or coherent with their NDC targets. When national energy policymaking and the NDCs are not aligned, there is a risk that climate and energy objectives in the Paris Agreement and the SDGs will be undermined.

Higher ambition – to reduce energy emissions far enough to achieve the long-term climate change goal – will be essential. All opportunities to increase the ambition of NDCs in this area need to be taken. Lack of coordination or disjuncture between NDCs, national SDG targets and national energy sector policies or plans could make it more difficult to raise mitigation ambitions. Accordingly, this policy brief assesses the links between developing countries' NDCs and their national energy policy objectives. This includes those related to the SDGs, as well as the extent to which their plans for energy sector development contribute to the current NDCs (or could contribute to revised, more ambitious ones).

Higher ambition – to reduce energy emissions far enough to achieve the long-term climate change goal – will be essential.

Research findings and recommendations

1. Energy emission reductions are not included in all NDCs

This analysis is based on a review of the NDCs and national energy objectives of 30 countries, including nine in Latin America and the Caribbean, eight in South and South-East Asia, and 13 in sub-Saharan Africa. (One of these countries, Nicaragua, did not submit an NDC.) The countries are listed in Table 1.

Country*	Estimated change in total emissions 2010-2030 before NDC (%)	Summary of NDC emissions pledges
Bangladesh	**78.1%**	**5% unconditional and 15% conditional reductions on business as usual (BAU) by 2030**
Benin	**47.6%**	**21.4% conditional reduction on BAU by 2030**
Brazil	**-14.6%**	**37% unconditional reduction by 2025 and 43% indicative reduction by 2030**
Cape Verde	**0.0%**	**No specific emissions reduction commitment.**
Colombia	16.4%	20% unconditional and 30% conditional reduction by 2030
Congo, DR	**66.5%**	**17% conditional reduction by 2030**
Congo, Republic	-9.5%	48% conditional reduction by 2025, and 55% by 2035
Costa Rica	-45.5%	Net emissions 9.374 Mt CO2-eq by 2030
Dominican Republic	34.6%	25% conditional reduction by 2030
Ethiopia	19.3%	-145 $MtCO_2e$ or lower by 2030
Ghana	**122.9%**	**15% unconditional and 45% conditional reduction by 2030**
India	**89.7%**	**33% to 35% emissions intensity conditional reduction by 2030**
Indonesia	12.2%	29% unconditional and 41% conditional reduction by 2030
Jamaica	66.7%	7.8% unconditional and 10% conditional reduction by 2030
Lao, PDR	**1.9%**	**No overall emissions reduction commitment. Estimated reductions ($MTCO_2e$) or specific actions.**
Malaysia	**85.2%**	**35% unconditional and 45% conditional reduction in emission intensity by 2030**
Mauritius	**60.0%**	**30% conditional reduction by 2030**
Mexico	-8.2%	22% unconditional and 36% conditional reduction by 2030
Mozambique	7.3%	-76.5 $MtCO_2e$ by 2020-2030
Nepal	11.9%	No specific emissions reduction commitment.
Nicaragua	-16.7%	No NDC.
Nigeria	**118.1%**	**20% unconditional and 45% conditional reduction by 2030**
Pakistan	31.6%	Work in progress to define actions
Peru	19.7%	20% unconditional and 30% conditional reduction by 2030
Philippines	43.5%	70% conditional reduction by 2030
Senegal	**114.0%**	**6% conditional and 31% unconditional reduction by 2030**
South Africa	1.4%	398 - 614 $MtCO_2e$ by 2025-2030
Tanzania	**0.7%**	**10% to 20% reduction by 2030**
Venezuela, BR	37.8%	20% conditional reduction by 2030
Zambia	**37.8%**	**25% unconditional and 47% conditional reduction by 2030**

** Bold indicates country includes energy in NDC mitigation pledge.*

Sources: http://www.climate-energy-college.net/indc-factsheets and http://www4.unfccc.int/registry/Pages/Home.aspx

Seven of the countries considered are low-income, while 11 are in the upper-middle income bracket and 12 sit within the lower-middle income category. Together, they account for 63% of the world's population that currently lacks access to electricity and 23% of the world's total greenhouse gas emissions.

Only half of the NDCs reviewed include action to reduce energy-related emissions, absolutely or relative to a business as usual (BAU) trajectory. The NDC of almost every country covers emissions from the production and consumption of energy, with around half including action to address their energy emissions. However, few quantify these energy emission reductions, and a reduction relative to BAU could result in an absolute increase.

Almost all of the developing countries included in our analysis, with energy objectives in their NDC, had objectives relating to renewable energy. Two-thirds of these were quantitative, with most focused on the power sector (e.g. actions to increase the renewable proportion of electricity generated or generation capacity or invest in renewable electricity). The NDCs' focus on renewable energy in the power sector may be explained by its significance as a source of energy emissions (38% of all energy emissions), the expected rapid growth in the demand for electricity and the existing trend towards renewable electricity globally, stimulated by a steep reduction in its cost.

The majority of NDCs are unspecific about plans for fossil fuel production and thermal generation capacity. Although fossil fuels account for over half the energy produced in 13 of the countries included in our analysis, only nine of the NDCs reviewed mention action to reduce fossil fuel emissions. When an NDC's energy content is focused on renewable energy plans, with no information on plans for oil, natural gas or coal production and consumption included, it is difficult to assess the overall contribution of that NDC's emission reduction targets for the energy sector. Bangladesh (Box 1) is an example where this has been done, while Tanzania's NDC does not fully reflect plans for the power sector (Box 2).

The majority of NDCs are unspecific about plans for fossil fuel production and thermal generation capacity.

Box 1: Bangladesh

The Bangladesh NDC aims to reduce total emissions in the power, transport and industry sectors by 2030: by 5% from the BAU projection (unconditionally) and 15% conditional on the provision of international support. The NDC estimates the total reduction from BAU will amount to 36 MtCO2e by 2030, with 44% from the power sector, 25% from transport and 31% from industry. The NDC also indicates that total emissions from these three sectors will be three times higher after these reductions than they were in 2011, their base year.

Bangladesh is planning to triple its generation capacity to 30.6 GW, by 2030. Half of this capacity will be coal-fired and 25% gas-fired. Total fossil-fuel generation capacity will be approximately 250% higher than in 2014. The NDC estimates that BAU emissions from the power sector will increase by 336% between 2011 and 2030. There are plans to increase renewable generation capacity substantially, with the Renewable Energy Policy (2008) aiming for 3.1 GW by 2021, and the Action Plan for Energy Efficiency and Conservation (2013) aiming for a 20% saving in energy consumption. As a member of the Climate Vulnerable Forum, Bangladesh has also committed to strive for 100% renewable energy as soon as possible. For the mitigation of power sector emissions, the NDC proposes use of 'super-critical' technology in all new coal-fired power plants. Although possible mitigation action in agriculture and land use are mentioned in the NDC, these are unquantified and there is no indication that they will significantly reduce the growth in total net emissions.

Sources: Ministry of Environment and Forests. (2015) 'Intended Nationally Determined Contributions'. New Delhi: Ministry of Environment and Forests; JICA and TEPCO. (2011) 'Power System Master Plan 2010'. Dhaka: Power Division, Ministry of Power, Energy and Mineral Resources.

Box 2: Tanzania

Tanzania's NDC proposes a 10 to 20% reduction in total emissions by 2030, against a BAU range of 138 to 153 MtCO2e. Reductions in energy-related emissions will contribute to this, but the NDC does not indicate how much. Action listed in the NDC that will help reduce these emissions includes:

- diversification in the energy system
- promotion of renewable power generation (e.g. geothermal, wind, solar and biomass)
- expansion of the use of natural gas
- promotion of energy efficiency
- rural electrification.

Plans for Tanzania's power sector feature the expansion of total generation capacity, to include 3.26 GW renewable energy and 5.46 GW fossil fuel capacity by 2030. The share of renewables in total capacity will be more or less unchanged (36.2%, compared with 38.4% in 2012). However, the five-fold increase in fossil fuel generation capacity includes coal-fired plants, which Tanzania does not currently have. The plans suggest that coal-fired capacity in 2030 will be greater than Tanzania's total installed capacity in 2012. A five-fold increase in emissions from power generation would add around 14 MtCO2e a year to the country's emissions in 2030. If the NDC conditional or unconditional pledges are fulfilled, Tanzania's total emissions will decrease between 2020 and 2030 because land use and forestry are net carbon sinks.

Sources: United Republic of Tanzania. (2015) 'Intended Nationally Determined Contributions'. Bonn: UNFCC; SE4All and UNDP. (2015) 'Tanzania's SE4All Action Agenda'. Dar es Salaam: Ministry of Energy and Minerals.

The principal objective for energy policy in developing countries is to ensure that the rapidly growing demand for energy can be met. The fastest-growing demand is for electricity; in all 30 of the developing countries included in our analysis, there are plans to expand electricity generation capacity. In some cases, capacity is expected to triple or quadruple by 2030. According to End Coal's Coal Plant Tracker, there are plans to invest in coal-fired generation in 19 of the selected countries. This would potentially lock-in reliance on fossil fuels for decades to come, and contribute to the increase in total emissions that some countries expect in 2030 after full delivery of their NDC.

In developing countries where the demand for energy is growing rapidly, increases in the proportion of renewables or renewable electricity capacity do not necessarily mean that emissions from electricity generation will decrease. Both of these objectives feature in NDCs and the SDGs, but they can also be consistent with increases in fossil-fuel emissions. For some countries, this means emissions will be higher in 2030 than they were in 2010 (Figure 1).

The partial coverage of energy emissions in NDCs can be addressed by including plans to mitigate emissions from energy production and consumption in all of them, based on realistic but ambitious energy development plans. NDCs should reflect a comprehensive assessment of emissions from all elements of the national energy system if they are to provide a clear picture of the country's overall contribution to global emission reductions. This should be done when the NDCs are reviewed during the facilitative dialogue in 2018.

2. National energy sector plans, national SDG energy targets and NDCs are not always aligned

The effectiveness of national energy policy will be decisive for achieving the objectives of both the Paris Agreement and the SDGs. The targets on renewables and energy efficiency in the global SDGs are directly relevant to the climate change goal of the Paris Agreement.

The effectiveness of national energy policy will be decisive for achieving the objectives of both the Paris Agreement and the SDGs.

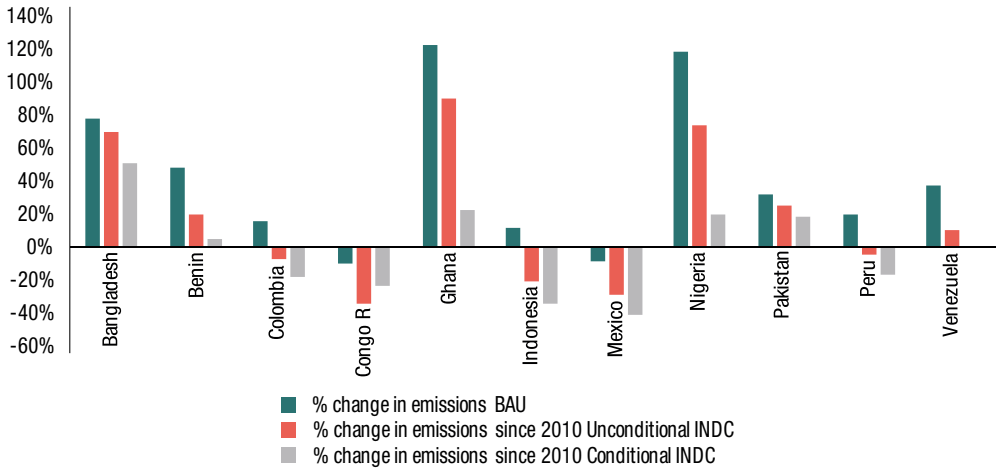
However, energy efficiency objectives in NDCs and national plans lack specificity. The NDCs of some countries, including India and Malaysia, are defined in terms of energy intensity (i.e. units of energy per dollar of economic output). Most NDCs have broad intentions to improve energy efficiency, but few provide specific targets. Many developing countries now have energy efficiency policies and objectives, including most of the countries included in our analysis. Some of these are sector specific (e.g. the power sector and electrical appliances). The adoption of energy efficiency targets in developing countries has been quite recent, but there is scope to strengthen efforts to improve energy efficiency in most countries and to include these actions in NDCs.

Plans to provide universal access to modern energy services could also be included in NDCs. The goal of universal access to affordable, reliable, sustainable and modern energy services has yet to be realised in 24 of the 30 developing countries included in this analysis. In most of these countries, there is a national target for access to electricity and, in some,

this is linked to renewable energy. However, few governments have a target for access to safe and clean fuels for cooking.

Emission reductions from decentralised renewable electricity, the 'least-cost' option to provide access in most rural areas, would be relatively small and a marginal addition to NDCs. The biggest benefit from universal access to safe and clean fuels for cooking would be to people's health, particularly women and children, but there would also be greenhouse gas emission reductions that could be included in NDCs.

Figure 1: Percentage change in emissions 2010-2030 for selected developing countries



Source: http://www.climate-energy-college.net/indc-factsheets
Notes: Intended Nationally Determined Contribution (INDC)

Benin's NDC, for example, indicates a 1.3% reduction in total emissions through the promotion of improved cook stoves.

As national energy objectives are revised and national SDG targets are adopted, it will be critical to coordinate and align actions for decarbonising energy to meet parallel NDC and SDG targets. When national energy policymaking or efforts on the NDCs and the SDGs are not aligned, the respective climate and energy objectives in the Paris Agreement and the SDGs may be undermined.

3. Planning for low-carbon energy systems in developing countries requires international support

Many countries have yet to include action to reduce energy emissions in their NDCs. Among those that do, there is variation in the level of detail they provide about the action that will be taken. Objectives are often unquantified and the emission reduction contribution not estimated. This may be because the detail is not yet available, partly due to limited capacity in developing countries to undertake the necessary analysis. Similarly, there may be limited capacity to plan the development of energy systems in an integrated way and plan for a transition to low-carbon energy systems. Increasing the ambition of NDCs, for example, will require a review of power sector plans, not least to take account of the recent change in the relative prices of renewable electricity and fossil-fuel generation.

However, many developing countries have relied on international support to prepare, first, their NDCs and reports to the UNFCCC and, second, the development of energy sector policies and plans. International support will be required to enable developing countries to prepare comprehensive policies and plans to transition to low-carbon energy systems. The imperative of reducing global emissions suggests this support should be provided immediately.

Conclusions

Collectively, the pledges contained in NDCs do not promise enough mitigation action to achieve the goal of the well-below 2°C goal of the Paris Agreement, let alone 1.5°C. Urgent additional action to reduce greenhouse gas emissions is an essential step in avoiding dangerous climate change. The scientific evidence indicates that global greenhouse gas emissions need to peak by 2020. Every opportunity to encourage an increase in emission reduction contributions in NDCs should be taken. This will be particularly important during the facilitative dialogue in 2018 that has been provided for in the Paris Agreement.

Increasing the ambition of NDCs can be achieved by including all planned actions that contribute to mitigation. The NDCs that do not yet specify action on energy-related emissions can take the step of including them. NDCs that do not have concrete or comprehensive energy emission targets can base them on planned changes in energy production and consumption. The revision of national energy development strategies in developing countries to reflect recent changes in the relative prices of renewable energy and fossil fuels – as well as align them with the SDGs – would add to the ambition of those countries' NDCs.

This material has been funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.