

Mitigation Measures Towards 1.5° C Global Temperature rise by 2030: A Comparative Analysis of

Nationally Determined Contributions (NDCs) of Ghana and Canada.

By Joseph Dennis N. Quarcoo | August 28, 2020

Why bother about climate change and mitigation for that matter?

The world is headed for an irrevocable urban future (Amin, 2013). The demands of urbanization and its related hikes in population as well as global consumption patterns inter alia have had and continue to impact negatively on our planet (Bryant L., Carver L., Butler C. D., & Anage A., 2009). Particularly, the emission of Greenhouse Gases (GHGs) namely, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and nitrogen trifluoride (NF₃) beyond the absorption capacity of the earth has resulted in an atmospheric concentration above 400 Parts per Million (PPM) for the first time in the last 800,000 years (Ritchie & Roser, 2017).

Climate change is thus 'one of the worlds most pressing challenges' today (Ibid, 1). If emission trends continue Business as usual (BAU), global temperatures will increase, falling within the range 3.1-3.7°C by 2030. This implies increased food insecurity, rise in sea levels and extreme weather events, loss of biodiversity, increased heat stress and water stress, and chronic poverty particularly in developing economies etc, (FAO, 2008; Kabir & Serrao-Neumann, 2020). Consequently, 195 parties in 2015 committed to the Paris Agreement to strengthen global response to climate change threats. Each country outlined its commitment/proactive actions to limit average warming to below 2°C in their Nationally Determined Contributions (NDC) document submitted to the United Nations Framework Convention on Climate Change (UNFCCC). This paper compares the mitigation measures indicated by Ghana and Canada. It attempts to identify potential for additional mitigation actions as well as evaluate the mitigation measures on the energy sector by both countries.

Ghana Vrs. Canada

Ghana has one of the fastest growing economies in Africa with a projected annual urban growth rate of 3.6% (The World Bank). As at 2012, Ghana's total contribution to global GHG emissions was 0.07% (WRI, 2017), ranking 151 out of 188 countries for per capita emissions (Ghana Climate Change Profile, 2018:3). Ghana is however highly vulnerable to global climate change with a rank 101 out of 181 countries according to the ND-GAIN index (2016). Ghana focused on five priority sectors – Energy; Transport; Agriculture Forestry and Other Land Uses (AFOLU); Waste, and Industry. Ghana was comparatively modest in its NDCs with an unconditional commitment to lower its GHG emissions by 15% relative to the BAU scenario emission of 73.95MtCO₂e by 2030 through domestic funding sources. Ghana introduced a conditional mitigation target of 30% emission reduction with international funding. A total of US\$9.81 billion will be needed to carry out the 20 mitigation actions outlined for the 10-year period (2020-2030).

Ghana will mobilize USD 2.02 billion to finance the two unconditional INDCs which are energy infrastructure projects (Ghana’s iNDC, 2015/Ghana’s NDC, 2017).

Canada has an unconditional mitigation target of 30% emission reduction below its 2005 level by 2030 i.e. to decrease emissions by 175 Mt. The Pan Canadian Framework was formed in 2016 to consolidate efforts and gains in emission reduction. Canada is using a blend of regulations and investment to drive down emissions. For example, Canada is implementing a carbon pollution pricing system to help influence investment and purchase decisions towards low-carbon intensive options i.e. \$10 per tonne across Canada in 2018 and will be rising to \$50 per tonne by 2022. Canada’s mitigation measures cover all intergovernmental panel on Climate Change (IPCC) sectors and has dedicated \$46.2 billion to support varied actions to reduce emissions including investment in green infrastructure (\$21.9b), urban public transport (\$20.1b) as well as \$2.2b for clean tech initiatives (Canada’s NDC, 2017).

ASSESSING THE MITIGATION MEASURES IN THE ENERGY SECTOR

GHANA	CANADA
<p>Scale up renewable energy penetration by 10% by 2030</p> <ul style="list-style-type: none"> • Increase small-medium hydro installed capacity up to 150-300MW • Attain utility scale wind power capacity up to 50-150MW • Attain utility scale solar electricity installed capacity up to 150-250MW • Establish solar 55 mini-grids with an average capacity of 100kW which translates to 10MW • Scale up the 200,000 solar home systems for lighting in urban and selected nonelectrified rural households 	<p>Expand the use of clean electricity and low carbon fuels to reduce emissions across the economy.</p> <ul style="list-style-type: none"> - Develop a clean fuel standard to reduce emissions from fuels used in transportation, buildings, and industry. - new regulations to accelerate the phase-out of traditional coal units by 2030 and - Performance standards for natural gas-fired electricity. <p>Investments to modernize Canada’s electricity systems:</p> <ul style="list-style-type: none"> - smart grid and - energy storage technologies, and - New and enhanced transmission lines to connect new sources of clean power with places that need it.
<p>Promote clean rural households lighting</p> <ul style="list-style-type: none"> • Increase solar lantern replacement in rural non-electrified households to 2 million 	<p>Reduce energy use by</p> <ul style="list-style-type: none"> - Improving energy efficiency, fuel switching and supporting innovative alternatives. <p>In the built environment sector, this will include</p> <ul style="list-style-type: none"> - developing “net-zero energy ready” building codes to be adopted by 2030 for new buildings; - retrofitting existing buildings based on new retrofit codes and - providing businesses and consumers with information on energy performance; and - Improving energy efficiency of appliances and equipment.
<p>Expand the adoption of market-based cleaner cooking Solutions</p> <ul style="list-style-type: none"> • Scale up adoption of LPG use from 5.5% to 50% peri-urban and rural households up by 2030. • Scale up access and adoption of 2 million efficient cook stoves by 2030 	
<p>Double energy efficiency improvement to 20% in power plants</p> <ul style="list-style-type: none"> • Scale up 120 MSCF12 natural gas replacement of light crude oil for electricity generation in thermal plants. 	

Whereas Canada is primarily exploring pathways into lower-carbon and clean electricity, transport, built environment and industrial sectors, Ghana is largely exploring avenues to extend the coverage of electricity as well as expand electricity generation capacity towards energy security. Thus, we observe that Ghana is at the primary level (e.g. scale up adoption of LPG use in peri-urban, distribution of solar

lantern in rural non-electrified household's etcetera). Canada is operating at a post-secondary to tertiary level (e.g. developing a net-zero energy code, accelerating the phase-out of traditional coal, installing a smart grid and so on). While these variance depicts a clear distinction between a developed and developing country, they also reveal the focus of governments. Ghana's action may be incremental but with a short-term focus. For instance, a strategy to develop decentralized rural off-grid (solar) may be much more robust and sustainable in the medium to long term than the mere distribution of solar lanterns at a cost of US\$300 million.

POTENTIAL FOR ADDITIONAL MITIGATION

Given Ghana's fiscal constraints in infrastructural and physical mitigation measures, Ghana must explore the development and enforcement of effective mitigation regulation as well as an effective public sensitization drive for public buy-in towards a net-zero carbon future.

Further, Ghana must pay attention to the building sector – the low hanging fruit (World Green Building Council, 2019). The Ghana building code must be more stringent as far as green building is concerned such as the compulsory use of rain harvesting systems etc. Awarding green building batches to contractors/firms; giving tax rebates on green buildings among other mechanisms can be adopted. Ghana/government must invest into research and development through partnerships with the private sector and Civil Society Organizations (CSOs) towards innovation in low carbon building materials, fuel and energy saving equipment

Also, Ghana can seek clear partnerships with one or more developed parties toward the financing of sustainable long-term mitigation measures outlined. Consequently, developed countries like Canada must look beyond the Pan Canadian Framework, and towards non-exploitative partnerships with developing parties like Ghana. Considering that developing countries are yet to enter into their industrialization phase, global progress in GHG emission reduction may be receded if low-carbon industrialization pathways are not discovered and explored by the former.

REFERENCES

Amin, A. (2013) The urban condition: the challenge to social science. *Public Culture*, 25:201-8.

Bryant L., Carver L., Butler C. D., & Anage, A. (2009). Climate change and family planning: least-developed countries define the agenda. *Bull World Health Organ* 2009;87:852–857 | doi:10.2471/BLT.08.062562 <https://www.scielosp.org/article/bwho/2009.v87n11/852-857/en/>

Canada's 2017 Nationally Determined Contribution Submission to the United Nations Framework Convention on Climate Change. Sourced online on August 20, 2020 from <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Canada%20First/Canada%20First%20NDC-Revised%20submission%202017-05-11.pdf>

FAO (2008). *Climate Change and Food Security: A Framework Document*. Sourced August 29, 2020 from <http://www.fao.org/3/k2595e/k2595e00.pdf>. Food and Agriculture Organization of the United Nations Rome, 2008

Ghana Climate Change Profile, (2018). Ministry of Foreign Affairs. 13 Feb 2019. Sourced online on August 20, 2020 from <https://reliefweb.int/report/ghana/climate-change-profile-ghana> (online material)

Ghana's Intended Nationally Determined Contribution. Sourced online on August 20, 2020 from <https://www4.unfccc.int/sites/submissions/indc/Submission%20Pages/submissions.aspx>

Ghana's Nationally Determined Contribution: Implementation Status by Antwi-Boasiako Amoah – Environmental Protection Agency. Sourced online on August 20, 2020 from https://www.uneca.org/sites/default/files/images/ghanas_nationally_determined_contribution_implementation_status_-_antwi-boasiako_amoah.pdf

Kabir M.E., Serrao-Neumann S. (2020) Climate Change Effects on People's Livelihood. In: Leal Filho W., Azul A.M., Brandli L., Özuyar P.G., Wall T. (eds) Climate Action. Encyclopedia of the UN Sustainable Development Goals. Springer, Cham. https://doi.org/10.1007/978-3-319-95885-9_7

ND-GAIN index (2016). Online material sourced August 20, 2020 from <https://gain-new.crc.nd.edu/country/ghana>

Ritchie H., & Roser M., (2017). CO₂ and Greenhouse Gas Emissions. Published online at ourworldindata.org. Retrieved from: <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

The World Bank (online material). Sourced on 20th August, 2020 from <https://www.worldbank.org/en/country/ghana/overview>

World Green Building Council (2019). New report: the building and construction sector can reach net zero carbon emissions by 2050. Published on Monday 23rd September 2019. Sourced online on August 20, 2020 from <https://www.worldgbc.org/news-media/WorldGBC-embodied-carbon-report-published>

WRI (2017) <http://cait2.wri.org/>