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FORESTRY, COAL POWER GENERATION AND ROAD TRANSPORT WILL BE MOST IMPACTED BY THE PARIS AGREEMENT

The Paris Agreement is, among other things, a collection of pledges by all the signatories on how emission reductions will take place in the respective countries. These Nationally Determined Contributions (NDC) are the best possible summary of climate change policies globally. Each NDC is different, but Carbon Delta has quantified these and disaggregated them into over 50 climate relevant economic sectors. This issue of The Emission provides a high-level overview and demonstrates why NDCs are essential components in analyzing transition risks in investments.

Introduction to Nationally Determined Contributions (NDCs)

As of today, 189 countries have prepared and submitted a Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat, whereby each country pledged a contribution to the Agreement's goal of limiting global warming to "below 2°C" by 2100. Together, the NDCs represent the largest body of international climate policies to be assembled under any single agreement

to-date. Never before has a "bottom-up" collection of climate policies (i.e. policies determined by national governments) been so clearly defined for researchers, civil society and businesses and their investors.

NDCs are required to be updated and re-submitted to the UNFCCC Secretariat every five years, with the first round of updates due in 2020, during which time a global stock-taking of policy progress will be documented, under a process known as the "Talanoa Dialogue". In fact, although it is only June 2019, the

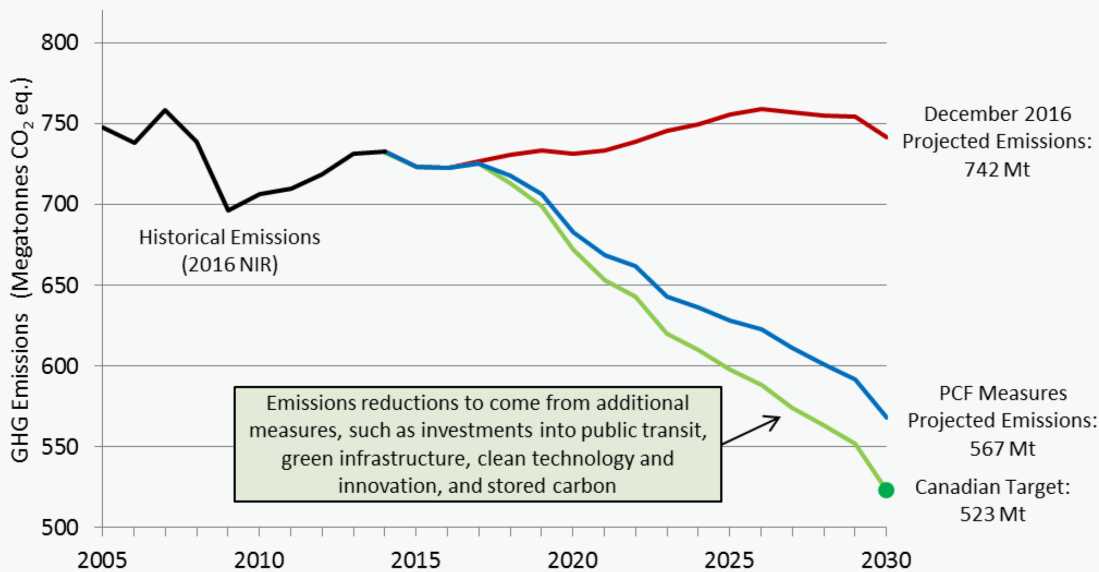


Figure 1: Example of an NDC target taken from Canada's NDC

Marshall Islands has already submitted their second NDC, in a sign of leadership and commitment to the UNFCCC process. The Paris Agreement is intended to be strengthened and enhanced through a “ratcheting” mechanism, whereby a country’s updated NDC is required to be more ambitious than its previous NDC. With varying degrees of detail included, each NDC reflects a country’s individual climate change-related circumstances, including climate mitigation and adaptation objectives, climate vulnerability, level of development, resource needs and availability, institutional framework, etc.

NDCs are therefore essential in quantifying climate change mitigation requirements in all countries. This comprehensive dataset of reduction targets is an important building block for any climate policy model. However, Carbon Delta goes further by quantifying each country’s pledge and translating it into reduction requirements for more than fifty economic sectors. Afterwards, the sectoral targets are broken down to around 30 000 companies to determine their individual greenhouse gas (GHG) reduction requirement per year.

Data Collection and Breakdown Methods

The starting point of this exercise was to analyze the NDCs of all the G20 countries. These NDCs, as stated above, were submitted to the UNFCCC following the COP21 in Paris (known as “The Paris Agreement”). The documents are very heterogeneous in the information they contain, thus rendering any further breakdown of the target a complex process. Further data was obtained from the various country ministries that usually define their targets for the sector they cover and additionally outside think-tanks and consultancies that were contracted by

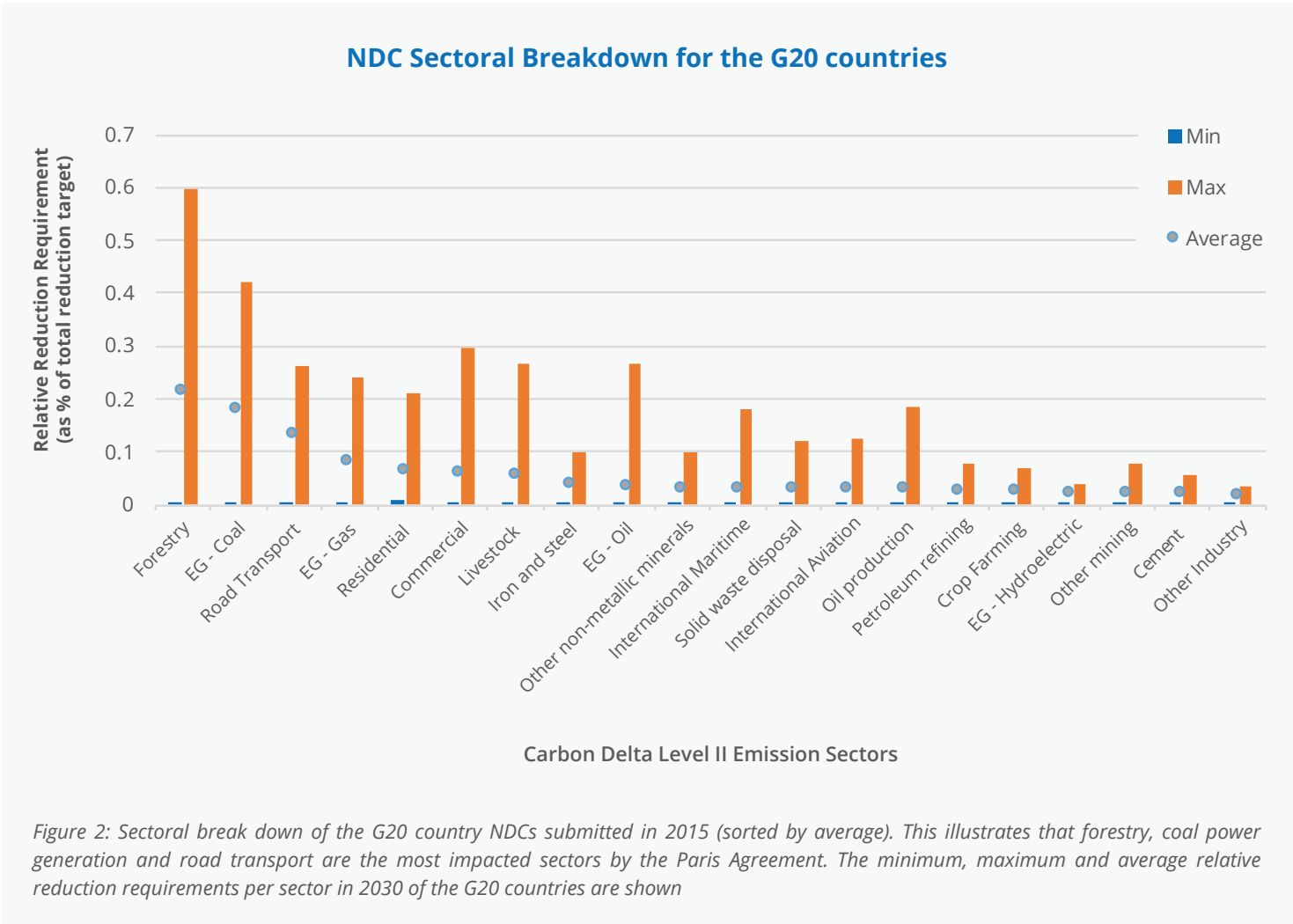
the ministries were used. Past and current emissions data were obtained from the UNFCCC and the IEA.

Each NDC provided various levels of detail concerning a sectoral breakdown of their overall reduction target. For certain countries, they did not provide any detail of the share each sector had to contribute to reach that target (e.g. Australia), Carbon Delta adopted a “fair share” approach. In this approach, the various sectors would have to reduce by their share of emissions in the overall emissions of the country. Others provided a partial sector breakdown of their target (e.g. the European Union) and a further breakdown of that partial breakdown was obtained by using the share of emissions each sector had and by multiplying that partial breakdown by the emission share of that sector. Finally, there were some countries that provided a detailed breakdown of how each sector would reduce their emissions (e.g. Japan).

After obtaining the sector wide emission reduction requirements of various countries, an allocation of reduction requirements to companies is then needed. The allocation method consists of having companies reduce their emissions by a fair share based on the relative amount their emissions represent in that sector. Carbon Delta uses this method to attribute reduction requirements to companies since this method considers the companies’ size of emissions and does not unfairly burden smaller emitters.

Sector-level GHG Reduction Target Analysis

In Figure 2, the minimum, maximum and average relative reduction requirements per sector in 2030 of the G20 countries



were plotted. One can notice right away that the forestry sector has the highest maximum reduction targets (around 60%) and average reduction targets (around 20%) out of all the sectors. This is because for countries like Indonesia, Argentina or Brazil, most of their reduction potential would come from curbing deforestation and/or increasing reforestation. The 15 sectors that follow forestry are the traditional high emitter sectors. One can see that electricity and heat generation from coal, gas and oil are in the top 10 sectors with the highest average reduction targets. This is due to the fact that to reach a 2°C or under world, country energy mixes have to deviate from conventional fossil fuel power plants to alternative energy, such as solar or wind. Most countries in their NDC present an energy pathway that would see less power generation through fossil fuels and more generation with renewable energies. Many countries rely heavily on an energy transition pathway to reduce their emissions and meet their NDC target. On average, the energy sector would contribute about 25-30% to a country's overall mitigation target. For example, Saudi Arabia's power generation sector represents about half of the country's overall mitigation potential and they are relying heavily on their transition away from traditional oil and gas power generation and more towards renewables[1]. Another notable point is the livestock sector. Most people tend to forget that this is a very high emitting sector that will grow in the future due to increased consumption of meat in developing countries that have a growing middle class. Most countries are trying to not reduce the methane emissions that directly come from the livestock, but by offsetting it with better pasture rotation, enhanced manure storage and usage and by using renewable energies. Certain countries like Argentina have put in place government funded training programs for farmers and ranchers to increase awareness and to promote better and more sustainable farming and ranching practices[2].

How can this data be used by investors?

This type of data is very useful in figuring out how a country's NDC will affect a certain company that is active in a sector (or sectors) of a certain country (or countries). By using the sectoral breakdown of a country's NDC, one can allocate emission reductions to companies (see above for how reductions are allocated) within that country to better understand the burden (financial, legal or other) to meet these targets in a certain sector. Investors can then engage with companies to understand how exactly they plan to reduce their emissions today so that they face less costs in the future (combining company emission reduction data with the company's low carbon strategy).

By understanding the exact amount of carbon emissions a company must reduce, one can then calculate an associated cost to these emissions by applying a carbon price. The resulting data would provide the total cost for a company to meet the implemented policies and/or policies to be implemented for the defined time period. Various carbon prices could also be applied to match different narratives and give a better vision of how different climate and socio-economic scenarios might affect companies. This gives valuable information to investors so that they know exactly how much a company will have to spend in order to meet policies within the countries and sectors the company is active in. Investors can then understand the financial risks associated with the companies in their portfolios transitioning to a low carbon economy and have a better understand of how this could affect their bottom line. This is opposed to just looking at the carbon footprint of a company, which cannot give you the cost for the company to meet current and future policies on its own. All of these are key components of Carbon Delta's transition risk model which specifically analyzes policy risk.

References

- [1] Saudi Arabia's NDC submitted to the UNFCCC: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Saudi%20Arabia%20First/KSA-INDCs%20English.pdf>
[2] Page 179 of Argentina's 3rd National Communication to the UNFCCC <https://unfccc.int/sites/default/files/resource/Argnc3.pdf>



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