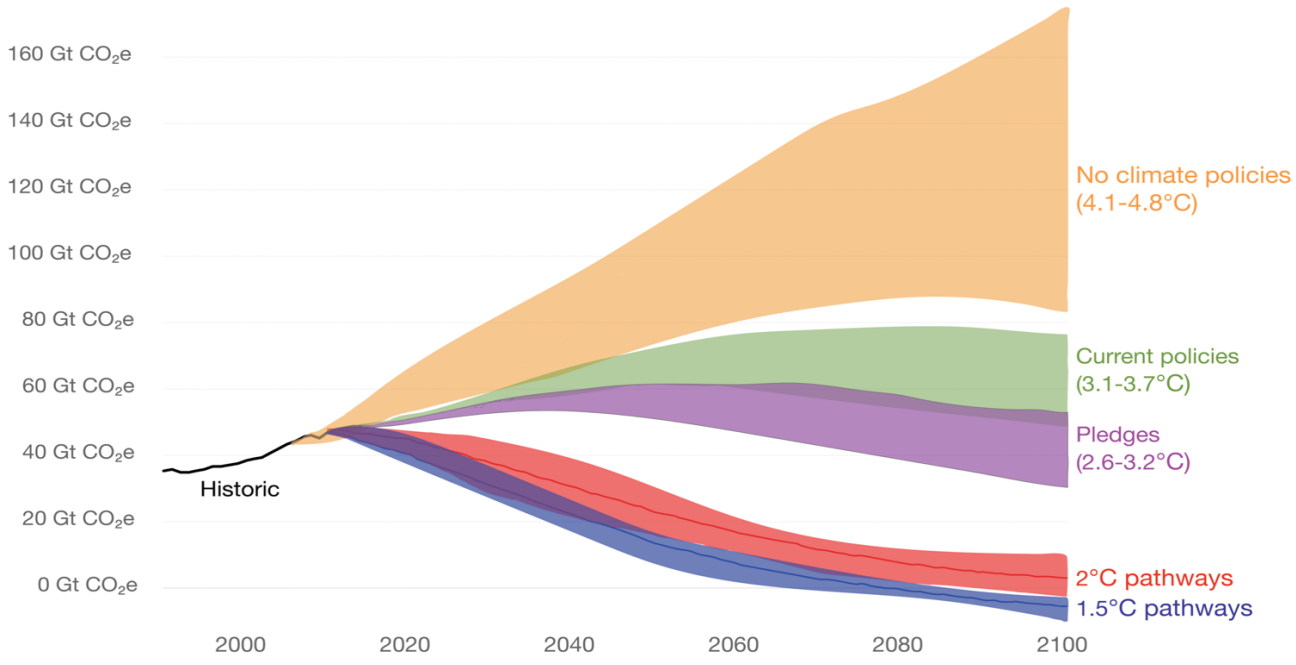
Responding to Climate Change Risks

As of March 2019, 195 UN members have signed the Paris Agreement. The long-term goal of this agreement is to keep the increase in global average temperatures to well below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Responding to climate change risks requires a unified and large-scale response. This agreement helps to provide the goals and the accountability (albeit without much enforcement power) to work towards responding to these risks.
There are now currently ongoing discussions between policymakers as to what is the most effective way in which policies should be designed to achieve the goals set out in the Paris Agreement. The two main policies being discussed are: (i) a carbon tax, or (ii) a range of targeted infrastructure government spending projects combined with regulation, such as the 'Green New Deal' that is being proposed by Democrats in the US. We discuss these two policy options in the second section of the paper. Before this, we take a look at the climate change data in section 1 and discuss some key trends. In the final section, we discuss our view of how to construct a policy response to climate change risks.

Climate Change Data

By taking a look at the data it's possible to begin to understand the size of the policy response required and where the focus needs to be placed going forward. For example, Figure 1 displays five different scenarios of global greenhouse gas emissions using data from Climate Action Tracker. The range of outcomes in the scenarios is broad, depending on what policies have been put in place at the moment. The diagram shows that there is currently an inconsistency between the goals set out in the Paris Agreement and the projections for where we are heading. The top, orange swathe scenario shows projected future emissions if no climate policies were implemented. The green swathe shows where we are heading based on current policies. The purple swathe shows the likely range for emissions if all countries achieve their national targets set within the Paris Agreement – far above the "well below 2 degrees Celsius" target. The final two scenarios show the pathways required to limit the temperature increases to 2 and 1.5 degrees Celsius, respectively. Both scenarios require a fairly dramatic policy response to be taken today in order to produce a rapid reduction in greenhouse gas emissions.

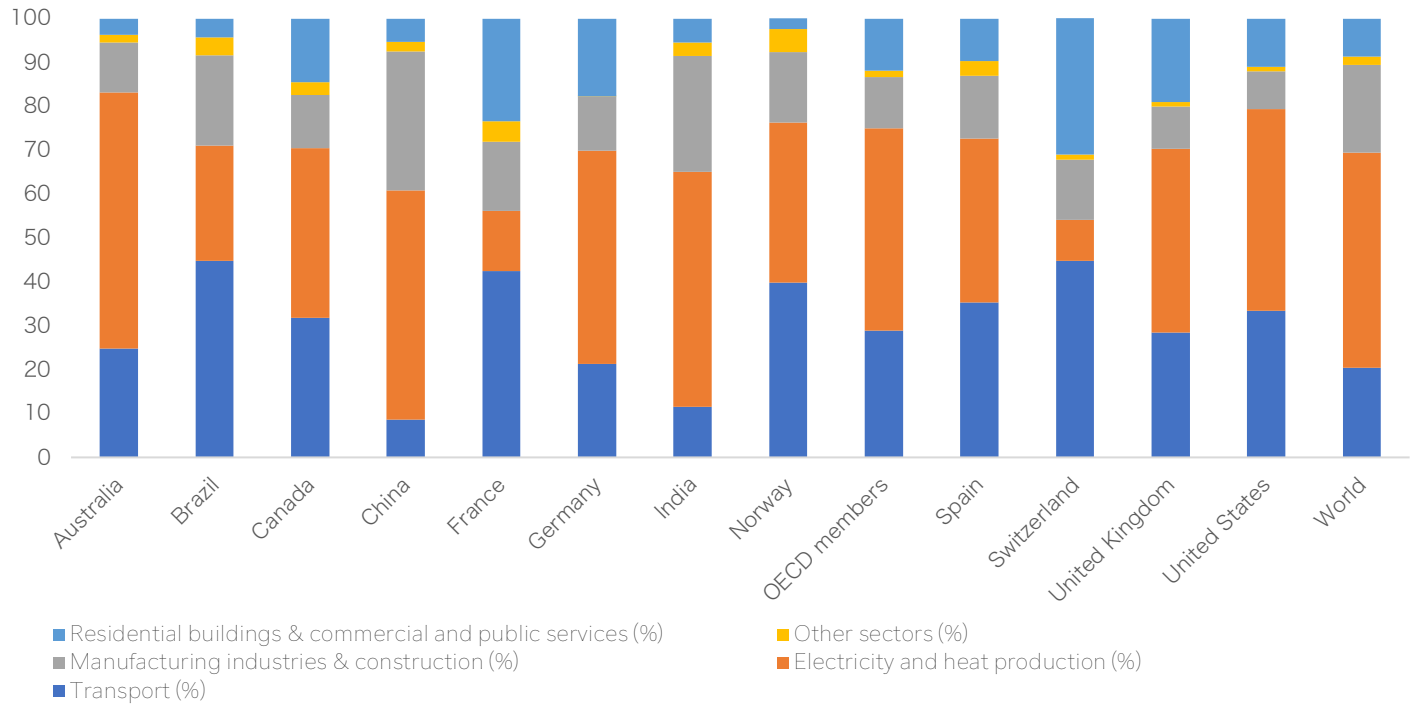
Figure 1: Global Greenhouse Gas Emission Scenarios[1]



[1] Source: Climate Action Tracker & Hannah Ritchie and Max Roser (2019)

Figure 2 shows that carbon dioxide emissions by sector across a range of varied countries can differ quite a lot. Generally, 'Electricity and heat production' tend to be the largest contributor for most countries, although for Switzerland this is proportionally smaller than other sectors. The message from this diagram is that the policy response across countries will not necessarily be the same for each country. For example, in Australia their main concern should be transitioning their 'Electricity and heat production' sector from being a high to low carbon emitting industry, given the size of this industry proportionally in terms of CO2 emissions. On the other hand, Switzerland should consider how they can reduce their CO2 emissions in their 'Transport' sector. Solutions are necessary for all the main CO2 emitting industries within a country but tackling the industries with the largest emissions first, as these are likely to be the most embedded into the foundations of that country, will often be the best place to start.

Figure 2: Carbon Dioxide Emissions by Sector or Source (% of total, 2014)



Lastly, the figure in the Annex displays a country's ecological footprint per capita (orange bars) and how this compares with the ND gain index (blue bars) which measures a countries vulnerability and resilience to climate change risks. This figure shows that there is a large divergence between exposure to climate risks and essentially the amount that a country is currently living beyond their means and therefore contributing towards climate change. The ecological footprint data was taken from the Global Footprint Network. Their studies determined that an ecological footprint of 1.73 global hectares per capita is equal to the world's bio-capacity, otherwise known as the level of demand that is compatible with environmental sustainability. Hence any country in the chart with a number >1.73 can be viewed as living beyond their means. In our diagram, since we start with the country with the smallest ecological footprint, these countries are lower than this level, but this only goes from Haiti to Honduras, the remaining 60-70% of countries listed have a value >1.73. The reason for the inverse trend in the blue bars is that the countries with the smallest ecological footprint per capita tend to be less developed and in many cases are highly reliant on their agriculture sector or geographically are more exposed to climate change risks. On the flip side, more developed economies tend to be more diverse and as such, are able to respond to the potential shocks from climate change in a more resilient fashion.

Discussing the Main Policy Options

Carbon tax

We will begin with the carbon tax. Taken from an economist's perspective, the rationale behind this policy is to ensure that firms and individuals pay the full social cost of carbon pollution. Starting with the arguments in favour of the tax since these are more straightforward: the tax should lead to a reduction in pollution and force firms to develop more environmentally friendly alternatives. It's not only this; it's very difficult to foresee what could be the full economic benefits of the tax due to the billions of knock-on effects it will have across the economic system. For example, it may encourage people to use greener modes transport such as cycling or walking which will lead to health benefits that go beyond the reduction in pollution. From the government's perspective, they will be raising revenue from the carbon tax and this will benefit their bottom line. This is assuming they choose to hold all other tax rates constant, of course they could choose to reduce other taxes such as VAT, benefiting consumers and keeping tax revenues broadly the same for the government. Although if they do choose to hold all other tax revenues constant, the government could use the increase in revenues to spend more by subsidizing the transition to other green alternatives to carbon.

Then in terms of arguments against the carbon tax: the main argument that most critics tend to state is that firms' production may simply shift to countries that don't have carbon taxes. Therefore, until all of the countries in the world adopt the tax, it's not likely to work. In addition, the cost of adopting such a tax has the potential be quite expensive (depending on how it is designed), reducing its efficiency. Related to this, there are lots of questions surrounding the optimal design for this tax, how do you determine the correct tax rate? Do you tax every carbon emitter in the country or only the largest producers of carbon? How do you prevent tax evasion from carbon production in an efficient way? Lastly, there is an expectation, at least in the short run that the tax would be detrimental for economic activity, due to the increase in energy costs. In the longer run, as alternatives to energy production become more central within an economy this effect is likely to dissipate.

Investing in a green economy

The alternative policy being discussed currently comes from a very different angle and this conversation began to come to the foreground in February of this year when the Democrat party in the US announced their 'Green New Deal' plan. The aims of this plan are extremely broad, touching on almost all areas of policymaking in the country. From an ideological perspective, the framework is based around large government injections into the economy in order to structurally shift towards a green and renewable based economic system. For example, they are suggesting a high-speed rail system to be implemented across the country that will lead to a massive reduction in the need for air travel. They are aiming for 100 per cent of US electricity to come from clean, renewable and zero-emission energy sources. They state the economic benefits of implementing these policies are that it will lead to the creation of millions of jobs across the country. The other slightly more obvious argument in favour of the policy is that in order to tackle climate change we have gone beyond the point of being reliant on market forces from a carbon tax: large action is required now to ensure the risks posed by the current path that we are on, do not crystallise.

There are also many arguments against this policy. The first of these is that for the Green New Deal itself, the politicians behind this plan have remained fairly vague with regards to the details of the policies, beyond making large scale promises about solving problems and where they'd like to be in the future. More generally though, this policy tends to be criticised most for its efficiency due to the scale of investment required in order to facilitate such large shifts in the structure of an economy. Many governments across the world already have large amounts of national debt and have been trying to reduce their debt levels since the financial crisis. As such, it's unlikely that it will be politically popular to ramp up fiscal deficits again. Especially given that the recent savings were aimed towards repairing previous damage and the majority of the benefits of this investment plan will only come to fruition in the future and may never be fully known, given we won't know what the alternative would be, meaning there are few benefits for people nowadays to implementing this policy.

Policy Response: The Exploring Happiness View

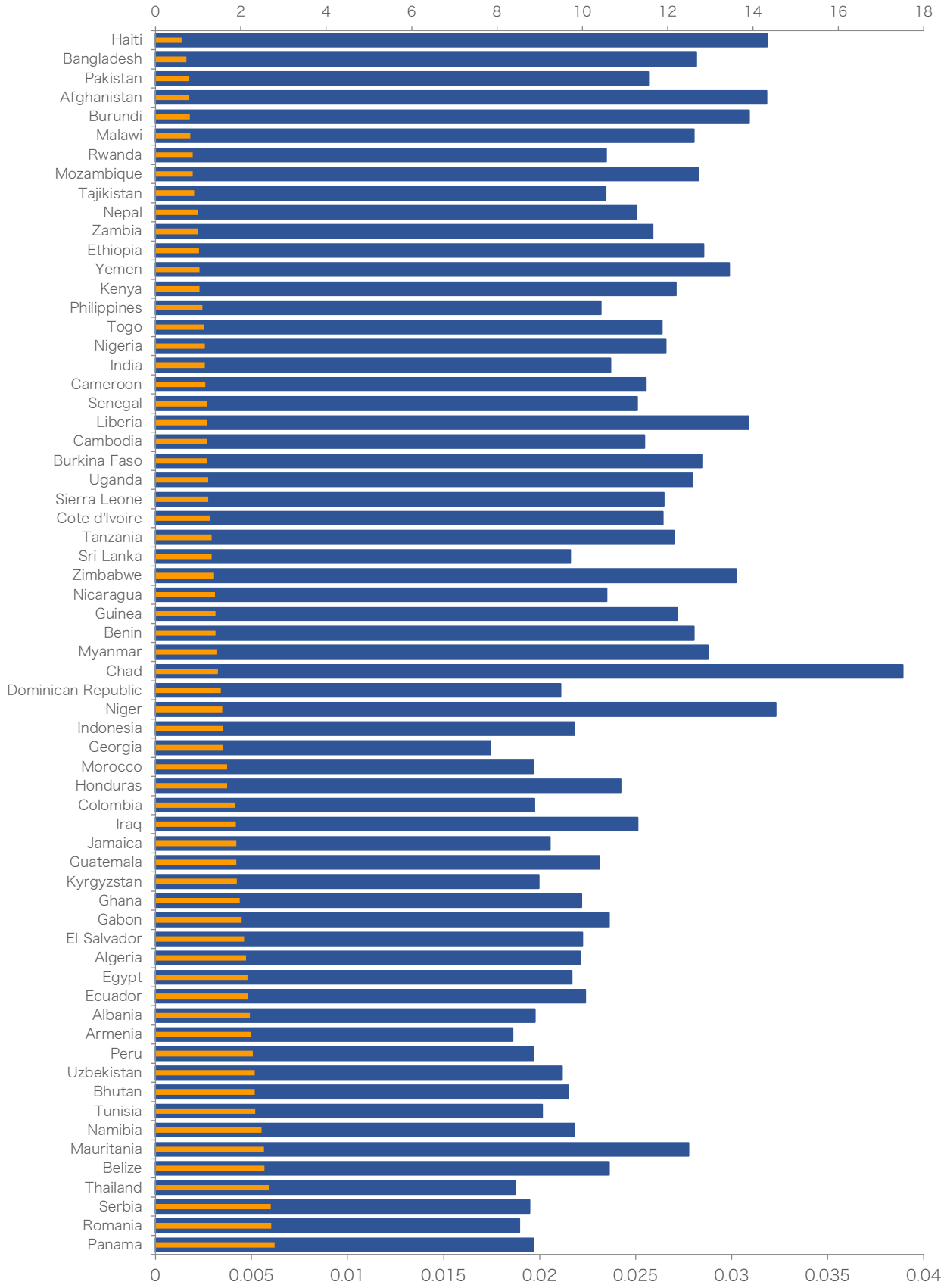
Before we offer our view in this debate, we'd like to briefly just explain two main reasons why as an organisation that focuses on happiness economics research we are discussing this topic in the first place. Firstly, in our very first research article we defined the goal of happiness economics as: *"aiming to increase happiness and wellbeing in society in a sustainable way"*. Our rationale at the time for including the sustainability element in the definition was that any increase in happiness that significantly damages the environment cannot be sustainable or benefit society in the long run. We are an organisation that focuses on the development of policies that will lead to sustainable increases in societies wellbeing and as such, environmental policies are at the very centre of what we do. Secondly, and related to this, from a happiness economics perspective there is no greater pressing issue than climate change at the moment. Improvements in quality of life, development and wellbeing all fall second in line to risks faced by not acting now to protect the future of the planet. This is not an overdramatic or pessimistic statement; it's a realistic one based on the facts – the diagram in Figure 1 shows this quite clearly.

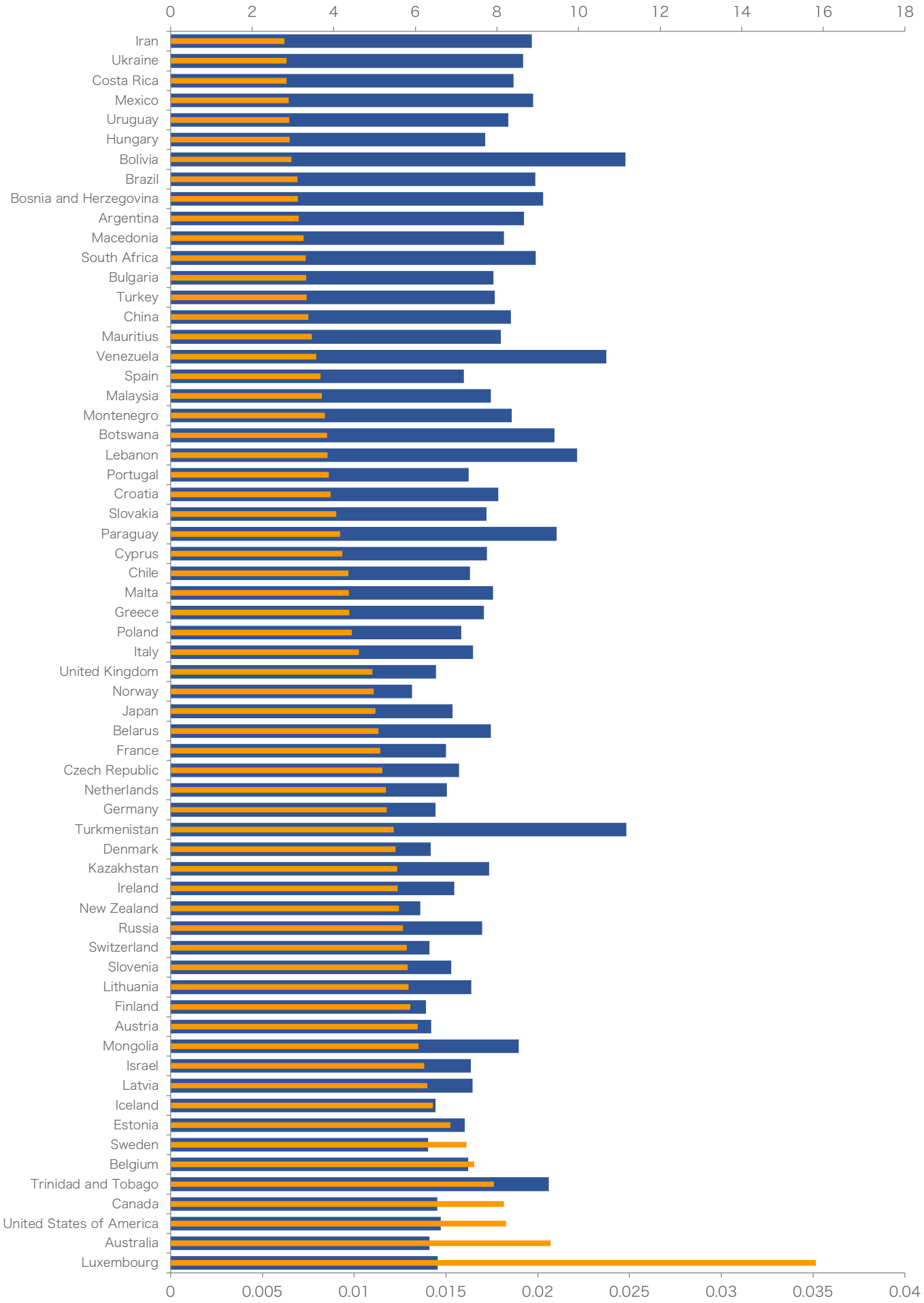
With this in mind, in terms of a policy response our view is that both a carbon tax and a targeted infrastructure plan should be put in place, in as many countries as is feasible. The carbon tax should be a starting point and should be implemented swiftly – the optimal design of this policy could be debated for decades, it will never be perfect, but its implementation will represent a large step in the right direction. Then in terms of the infrastructure spending plans, this should be done by taking the revenues from the carbon tax (and additional government spending, where possible) to change the structure of high-carbon producing economies to become green and renewable based. Our view is that the best way that this can be implemented is through a top-down approach with government co-ordination with industries to find intelligent solutions for facilitating these structural changes. For example, governments should put in place overarching targets (similar to the ones in the Paris Agreement) and then show how they plan to reach these targets through sub-targets for reductions in greenhouse gas emissions across a range of important industries in that country (thinking about our message in Figure 2). This needs to be a well-defined co-ordinated plan that is publicly accountable, such that should participants fail to meet their targets they will be publicly named and there should be financial disincentives should participants fail to meet targets several times.

One of the main challenges that is raised when climate change policies such as these are proposed is: *"why should we bother to do all of this if X aren't going to do the same?"*. The answer to this is simple: that view doesn't solve any of our problems, it allows us to kick the can down the road whilst we all look for someone to lead on this. It is necessary to lead by example with climate change policies, not all countries will choose to act now but history will look back kindly on those that do.

Annex – A divergence between exposure to climate risks and per capita footprint

In the two diagrams below the orange bars relate to each country's ecological footprint per capita (top axis, 0-18, lower = better), whilst the blue bars relate to ND gain index which measures a countries vulnerability and resilience to climate change risks (bottom axis, 0-0.04, lower = better).

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