GREEN GROWTH OPPORTUNITIES

How developing economies can capitalize on the green transition

Ricardo Hausmann

Picture yourself as finance minister of a developing economy. An eager environmentalist tries to convince you of the moral imperative of cutting your country's greenhouse gas emissions. You soon become bored because you've heard it all before, and your mind moves to more pressing matters. Your country is full of problems, from economic instability and inflation to challenges funding public services. Reducing emissions is not a priority.

Even if you were to succeed, your impact on the climate would be minuscule. Countries as populous as Pakistan, Nigeria, and Egypt each represent less than 1 percent of the world's emissions. Your country's emissions—even cumulative since the Industrial Revolution—are infinitesimally small. Eliminating them all would have no material impact on the climate: you would have incurred costs and forgone opportunities to deliver economic prosperity with little to show for it.

Yet it would be a grave mistake not to consider climate change as an important aspect of your job. Change is sweeping across the global economy as countries recognize that the world must slash emissions to prevent a climate catastrophe. Decarbonization will reduce demand for dirty goods and services and increase demand for those that are cleaner and greener. The question is not what you can do to reduce your country's emissions but how you can supercharge your country's development by breaking into fast-growing industries that will help the world reduce its emissions and reach net zero.

Your country's history has been fundamentally shaped by the development of the few products it is able to make at home and sell abroad. Successful economies in east Asia and eastern Europe have sustained decades of high growth by upgrading their areas of comparative advantage, from garments to electronics to machinery and chemicals. They did not remain stuck in industries bequeathed by the past. If your country is to create jobs that pay higher wages, it will have to find new industries that can grow and export competitively even with higher wages.

Pessimists say that opportunities may have been there in the past for countries like Japan, Korea, or China, but those paths to development are now closed. Decarbonization will, however, create new opportunities—especially for those that move fast. The paths that are opening up have not been trod by many predecessors. Some are still virgin. Decarbonization will require significant greenfield investments, and plants will have to find new places to locate. This could be a great opportunity for your country, but to assess it, you must understand the changing landscape.

We do not know what technologies will power the low-carbon global economy or what materials and manufacturing capabilities they will need—nor what regulatory regimes the world will adopt, let alone what kind of cooperation or conflict will characterize relations between the largest emitters. These uncertainties will be resolved by those countries that play an active role and master the capabilities that will underpin their future comparative advantage. Keep in mind these six themes as you explore and exploit the opportunities and threats.

1 Embrace global electrification.

More than 70 percent of global emissions come from energy use. To decarbonize, the world needs to electrify the things we currently do with fossil fuels and generate that electricity from green sources such as wind and solar. This will require massive amounts of solar panels, wind turbines, electrical cables, and capacitors as well as mechanisms to store energy, such as lithium-ion batteries. Electrolyzers and fuel cells will be needed as well to convert electricity into hydrogen and back. All these products are highly intensive in metals and rare earth elements. Production of these minerals will have to expand by several multiples if the world is to achieve net zero. So net zero requires a mining boom.

Mining itself is a highly energy-intensive industry. The future is likely to demand that the energy used in mining be green, too. Mining also has local environmental impacts and is water-intensive. Most countries fail to implement a regime that is open to investment but adequately manages these risks and conflicts of interest.

In addition, these minerals must be processed into the capital goods needed by electrification. This involves long manufacturing global value chains. Today many megafactories are being built to produce lithium-ion batteries, mostly in China, Europe, and the US. Why are none in your country? Do you have what it takes to host them? If not, can you acquire the missing capabilities?

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While some industries will grow as the world decarbonizes, others will shrink. Some may be in your country. You must identify export industries that will face headwinds because they are high emitters or supply high-emitting value chains. Vested interests at home will dismiss global warming as a hoax and mobilize against greening policies. But they will be impacted nonetheless by these global trends. Sooner than you think, your companies in these industries will struggle to access financing because capital markets will fear that the assets they fund will be stranded. Find ways to redeploy capabilities to more promising prospects.

2 Capitalize on proximity to renewable energy. The sun shines and the wind blows in many countries, but some (including Namibia, Chile, and Australia) are working hard to use these resources to produce green energy products. This may be a first step to an even more promising future. Here's why.

Oil and coal are incredibly energy-dense, meaning they contain a lot of energy per unit of weight and volume. This makes them cheap to transport. If a barrel of oil is worth about $100 at the well, shipping it halfway around the world costs less than $4. As a consequence, oil and coal made the world flat from an energy perspective. Energy-poor countries could become competitive in energy-intensive products. China, Japan, and Germany, for example, are major steel exporters but energy importers.

This is unlikely to be the case with the alternatives to oil. With natural gas, for instance, there are huge price differences between markets because of the difficulty and cost of liquefying and transporting liquefied natural gas. Countries with a lot of sunshine produce solar energy for less than $20 a megawatt hour. To move the energy a long distance, it must be stored in a molecule such as ammonia. But the conversion will increase the cost of energy sixfold (not counting the cost of transport). This creates enormous incentives to use renewable energy in situ. Energy-intensive industries will move toward places rich in green energy. Will your country be one of them?

3 Keep the cost of capital low. The sun shines, the wind blows, and the rain falls for free. Most of the cost of renewable-energy production is the fixed cost of the equipment, including the cost of the capital to buy it. How much are you paying? If you are in Germany, maybe you can get funding at 2 percent. In the Dominican Republic, it may be 7 percent. So, although the Dominican Republic is sunnier than Germany, this does not translate into cheaper solar energy. This is a major issue because the sun is strong in the tropics, but capital markets shun these regions, reversing their comparative advantage. Good institutions and macroeconomic management that keep country risk low are critical determinants of the cost of capital and hence your country's ability to be competitive in green energy.

The world is full of countries that have squandered their natural endowments because of failures in macroeconomic and mining-sector governance. Venezuela arguably has the world's largest oil reserves, but oil production has fallen by 80 percent from a peak in 1998 because of oil expropriation and macro mismanagement that scared off capital markets. A similar fate could await countries with metals needed for the green transition, such as lithium, cobalt, copper, aluminum, and nickel, if they mismanage their resources.

4 Manage technological risks. Technological uncertainty has always been with us. Who would have thought the smartphone would displace the alarm clock, the camera, the CD player, and even the personal computer? Today one megawatt hour of solar energy when the sun is shining or the wind is blowing is cheaper than the fossil fuel needed to generate the same megawatt using a thermal plant. This was unthinkable a decade ago.

On the road to net zero, we do not know which technologies will win the race. But we are aware of many of the technologies in the running. They first appear as ideas in scientific papers and patents. They then move on to pilot and eventually commercial plants. You should be aware of the bets being placed across the world.

Technological surveillance is done regularly by industry, but few governments do enough of it. Israel and Singapore have chief scientists in their economy ministries to anticipate changes that may be coming and decide the most promising R&D bets. Given the large lithium resources in Chile, the government is investing in a lithium research center with a consortium of global universities so

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that it can be on top of the technologies that might reduce costs and enhance the use of lithium while tracking those that may displace it.

5 Explore carbon sinks. Net zero is not gross zero. The difference is carbon capture, and the future is likely to create markets for it. You may be able to obtain carbon credits by reforesting deforested areas or by protecting existing forests. In the Amazon, for example, people are felling trees because it is more profitable to use the land for cattle ranching. Yet at reasonable carbon prices, the forest can capture carbon that is more valuable per hectare than beef. But carbon prices today are not reasonable. In many countries they do not even exist or, if they do, they are a small fraction of those in Europe—too low to make forests more profitable than cattle ranching.

In a well-functioning market, carbon prices should be equalized globally because the atmosphere is global. But markets cannot trust that carbon captured by trees this year is not going to return to the atmosphere next year when somebody clears the land for cattle. For this reason, your carbon credits trade at a huge discount, if at all. You need to develop the institutions for credible carbon credits.

There are other sinks, too. You may have geological formations that are ideal to store carbon that has been captured. You should figure out where these are and certify that they are safe and sealed. You must define property rights on these geological formations so that investment can take place and you can collect a rent from storage space. This will require work because legislation was built assuming people would take valuable materials out of the ground, not put unwanted residues into it. If you develop a long-term carbon sink market, it could preserve your forests, find new value in your subsoil, and help the world decarbonize.

6 Plan to learn. No country today excels at the technologies and industries that will shape the future. But some will learn and others will not. What will you do to make sure your country is in the first group? Too often countries are told to shun things they don't do well and focus on things they are good at. But growth has never been just about focusing on current areas of comparative advantage. It is also about evolving that advantage. France has a long history of being good at wine and cheese, but it also became good at commercial aircraft and high-speed rail. Who will develop the capacity to manufacture electrolyzers competitively? Who will transform their sunshine and wind into a source of advantage? It will be those that focus on attracting strategic investments and global talent, on facilitating technological adoption by supporting research programs at universities and beyond. It can seldom be done by closing off the domestic market.

Asking countries to contribute to global decarbonization by prioritizing the reduction of their own carbon footprints is an unhelpful framework. Creating value and livelihoods at home by helping the world decarbonize is a more promising proposition. Because these are new challenges, they are bound to be open to new players. You can be one of them. The payoffs could be huge. FD

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