



# When Giants Arise

The Real World of GHG Emissions and Growth

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# WHEN GIANTS ARISE

## EXECUTIVE SUMMARY

Many people in Europe and North America today take it for granted that what the countries of “the west” decide to do in political and policy terms will lead, or at least set the broad agenda for, the whole world. This perception influences how people view climate change policy. Those who accept the thesis that human greenhouse gas emissions are causing catastrophic climate change may assert, in the face of little dissent, that the “leadership” of western countries will cause the entire world to alter the ways that it produces and uses energy so as radically to reduce emissions. In this article, I will try to show how reality differs from this perception.

In addition, I will try to show why, over the period to 2050, the “west” will be surpassed by at least two, and possibly more, global economic powers that will be the real “leaders” with respect to emissions decisions.

The history of international climate diplomacy since 1992 can be described as elaborate in process and meagre in results. The period from 1992 to 2015 was spent in repeated but failed efforts to impose collective and enforceable emissions reduction requirements. With very few exceptions, no country ever met the targets set. After 19 conferences of the Parties to the Framework Convention on Climate Change, the countries of the world gave up on collective target-setting and switched to efforts to promote country-specific measures aimed at the nebulous and arbitrary goal of restraining global temperature increases to less than two degrees Celsius by 2100. The agreement reached at the 2015 Paris Conference required countries only to submit voluntary emission reduction plans every five years. Neither China nor India, the two fastest growing sources of GHG emissions, committed to make reductions by 2030.

This diplomatic activity has completely failed to alter the growth in global carbon dioxide emissions. They rose from 22.45 billion tonnes per year in 1990 to 35.8 billion tonnes in 2016, an increase of 59%. They continued to rise until the onset of the COVID-19 pandemic. While the countries of the Organization for Economic Cooperation and Development (OECD), at enormous cost, have reduced their emissions, those of the non-OECD countries have risen by almost five billion tonnes per year, and in 2019 constituted 65% of global emissions.

The projected trends in population, economic growth and energy markets virtually guarantee that these trends will continue. According to United Nations data, the global population will grow by more than two billion people between 2018 and 2050, and almost all of this growth will be in Asia and Africa. Europe and North America, which had only 15% of the world’s population in 2018, will see that share shrink to 11% by 2050.

A 2017 report by Price Waterhouse Cooper (PWC) offered excellent analysis of the likely patterns of economic growth by region and country to 2050. Among other things, the report found that the world economy could more than double in size by 2050, far outstripping population growth, due to continued technology-driven productivity improvements. Further, emerging markets (E7) could grow around twice as fast as advanced economies on average. (The E7 countries are China, India, Brazil, Russia, Indonesia, Mexico, and Turkey. The G7 countries are the United States, Germany, Japan, the United Kingdom, France, Italy, and Canada.) As a result, six of the seven largest economies in the world are projected to be emerging economies in 2050 led by China, India, and Indonesia. The United States could drop to third place in the GDP rankings, and the European Union share of world GDP could fall below 10% by 2050.

The United States Energy Information Administration, in its 2019 International Energy Outlook report projected the trends in global energy supply, demand and emissions to 2050. Its economic projections broadly coincided with those of PWC. Overall, the 2019 EIA Outlook projected world energy consumption to rise nearly 50% between 2018 and 2050, due almost entirely to strong economic growth, increased access to marketed energy, and rapid population growth in the non-OECD countries. World energy-related CO<sub>2</sub> emissions are projected to grow at an average rate of 0.6% per year between 2018 and 2050, with the rate of growth in the non-OECD countries at about 1% per year. In other words, the EIA projects global CO<sub>2</sub> emissions to grow from about 34 billion tonnes in 2018 to 43 billion tonnes in 2050.

This is a long, long way from the “net zero emissions” targets that environmental groups and some western governments are imposing on their citizens. If such emissions reductions were feasible, and if all OECD countries attained them, but emissions growth continued in the non-OECD as now projected, by 2050 global emissions would be about 29 billion tonnes per year, only 16% below the 34.2 billion tonnes of global emissions in 2019.

Whatever “leadership” western countries may have enjoyed in the past is fast being overtaken by the economic and population growth in the non-OECD countries and especially in Asia.

Just as China has over the past few decades taken its place as one of the largest and fastest growing economies in the world, a number of other “giants” are waiting in the wings, ready to take their places among the centres of global economic activity, with standards of living that approach those in the G7 countries today. Those waiting giants notably include India, Indonesia, Brazil, Mexico, Saudi Arabia, and Nigeria. Their rapidly increasing populations and economies will require much more energy, including the hydrocarbons like coal, oil, and natural gas the countries of the west relied on during their ascents to prosperity and world influence. With its ever-declining shares of global population and income, “the west” will not be able to constrain the aspirations, or the emissions, of the emerging giants.

# WHEN GIANTS ARISE

## Public Perceptions of the “West” and the World

Ipsos, the famous polling firm, frequently publishes surveys of the people’s perceptions in different countries about social and economic conditions. For most people living in North America, their vision of the world is one in which “the west”, meaning broadly the countries of Europe and North America, is the dominant source of economic and political power. In fact, since the Second World War, western dominance has been built into the structure of all the important international institutions, including the Organization for Economic Cooperation and Development (OECD), the World Bank, the

International Trade Organization (ITO), the North Atlantic Treaty Organization (NATO), and even the United Nations. Consequently, many of those alive in the west today take this as the natural order of things and assume that what the countries of the west decide to do in political and policy terms will lead, or at least set the broad agenda for, the whole world.

This perception influences how people view climate change policy. Those who accept the thesis that human greenhouse gas emissions are causing catastrophic climate change may assert, in the face of little dissent, that the “leadership” of western countries will cause the entire world to alter the ways that it produces and uses energy so as radically to reduce emissions.

In this article, I will try to show how reality differs from this perception. Specifically, I will describe how the thesis:

- ignores the actual experience of international climate diplomacy over the last thirty years;
- misjudges the population and economic trends that are now forging new patterns of global dominance; and
- fails to take into account the reasons why economic development in the emerging economies will largely be fueled by hydrocarbons and therefore produce higher carbon dioxide emissions.



<https://www.cbc.ca/news/canada/calgary/canada-alberta-cop21-new-tone-1.3345308>

Thus, I will try to show why, over the period to 2050, the “west” will be surpassed by at least two, and possibly more, global economic powers that will be the real “leaders” with respect to emissions decisions.

## A Brief Summary of Global Climate Diplomacy Since 1990

In 1992, the countries of the Organization for Economic Cooperation and Development (OECD), including Canada, agreed to set voluntary targets to stabilize their greenhouse gas (GHG) emissions at 1990 levels by the year 2000. A small number of European countries (notably Germany and the United Kingdom) met this goal. Almost all others, including Canada, did not.

In 1997, the countries party to the United Nations Framework Convention on Climate Change agreed to a formal treaty (i.e., the Kyoto Protocol) under which they would commit to reduce GHG emissions by 5% on average from 1990 levels by the end of the “first commitment period” in 2012. Canada signed the treaty and committed to reduce emissions by 6% from 1990 levels.

The United States Administration signed the Kyoto Protocol in 1998, but did not submit it for ratification to the US. Senate. In 2011, Canada, Japan and Russia declared that they would not take on further Kyoto targets. Canada announced its withdrawal from the Kyoto Protocol in December, 2011, as it was clear by then that continued adherence would expose Canada to hundreds of millions of dollars in penalties. Almost all of the countries that signed the Kyoto Protocol missed their emission reduction targets.

A second commitment period started in 2012, known as the Doha Amendment to the Kyoto Protocol. Under this agreement, 37 countries set binding targets; almost all of them were European countries.

In 2012, Canada committed voluntarily to reduce emissions to 17% below 2005 levels by 2020. By 2018, it was clear that Canada would not meet this target, either.

In 2015, prior to the 21st Conference of the Parties (COP21) Conference in Paris, Canada voluntarily committed to an even more stringent target, that is, to reduce GHG emissions to 30% below 2005 levels by 2030. The Agreement reached at that conference did not require countries to accept legally-binding commitments, only to submit Intended Nationally Determined Contributions (INDCs), or emission reduction plans, every five years. Neither China nor India, the two fastest growing sources of GHG emissions, committed to make reductions by 2030. The United States Administration announced its withdrawal from the Paris Agreement in 2016.

COP26 was supposed to occur in 2020, before which all of the Parties were committed to submit updated INDCs. Due to the coronavirus, the conference has been rescheduled to 2021. As of 2019, it was clear that, with the possible exception of the European Union, none

of the ten largest GHG emitters in the world, representing 79% of global emissions, would meet its 2030 target.

So, there has been almost 30 years of global climate diplomacy, 25 major “conferences of the Parties”, and innumerable meetings of international climate subcommittees.

## The Trends in GHG Emissions Since 1990

Tracking the historical trends in greenhouse gas and in carbon dioxide emissions should be easy, given the constant political focus on this set of numbers. Instead, there are a range of sources with important variations among them in terms of definitions, data coverage and

Global Fossil Carbon Dioxide emissions by Year

Year	Fossil CO2 Emissions (tons)	CO2 emissions change	CO2 emissions per capita	Population	Pop. change
2016	35,753,305,000	0.34%	4.79	7,464,022,049	1.14 %
2015	35,631,078,000	-0.16%	4.83	7,379,797,139	1.16 %
2014	35,686,780,000	0.76%	4.89	7,295,290,765	1.17 %
2013	35,416,599,000	1.80%	4.91	7,210,581,976	1.19 %
2012	34,790,564,000	0.61%	4.88	7,125,828,059	1.20 %
2011	34,578,390,000	2.95%	4.91	7,041,194,301	1.21 %
2010	33,587,787,000	5.72%	4.83	6,956,823,603	1.22 %
2009	31,770,516,000	-1.10%	4.62	6,872,767,093	1.23 %
2008	32,124,428,000	0.65%	4.73	6,789,088,686	1.24 %
2007	31,916,504,000	3.77%	4.76	6,705,946,610	1.24 %
2006	30,756,174,000	3.32%	4.64	6,623,517,833	1.25 %
2005	29,769,008,000	3.62%	4.55	6,541,907,027	1.25 %
2004	28,729,309,000	4.42%	4.45	6,461,159,389	1.25 %
2003	27,513,926,000	4.42%	4.31	6,381,185,114	1.26 %
2002	26,350,081,000	1.82%	4.18	6,301,773,188	1.27 %
2001	25,877,903,000	1.11%	4.16	6,222,626,606	1.29 %
2000	25,593,733,000	3.48%	4.17	6,143,493,823	1.31 %
1999	24,733,708,000	0.78%	4.08	6,064,239,055	1.33 %
1998	24,541,647,000	0.59%	4.10	5,984,793,942	1.35 %
1997	24,398,282,000	1.34%	4.13	5,905,045,788	1.38 %
1996	24,075,938,000	1.93%	4.13	5,824,891,951	1.40 %
1995	23,619,144,000	3.15%	4.11	5,744,212,979	1.43 %
1994	22,898,963,000	1.04%	4.04	5,663,150,427	1.46 %
1993	22,664,346,000	0.78%	4.06	5,581,597,546	1.50 %
1992	22,488,598,000	-0.45%	4.09	5,498,919,809	1.56 %
1991	22,591,041,000	0.63%	4.17	5,414,289,444	1.63 %
1990	22,450,442,000	0.49%	4.21	5,327,231,061	1.71 %

availability of information for recent years. One easily accessible source is Worldometer, which can be found here.

<https://www.worldometers.info/co2-emissions/co2-emissions-by-year/>

According to Worldometer data, global carbon dioxide emissions in 1990 were 22.45 billion tonnes per year. By 2016, they had risen to 35.8 billion tonnes, an increase of 59%. They continued to rise until the onset of the COVID-19 pandemic.

The British Petroleum Statistical Review of World Energy is one of the most authoritative and accessible sources of information on global energy supply, demand, and emissions trends. Its figures show carbon dioxide emissions from energy consumption alone. According to the 2020 edition of the review, global carbon dioxide

emissions rose from 29.7 billion tonnes in 2009 to 34.2 billion tonnes in 2019, a 15% increase. Aside from the global totals, the BP reviews indicates the trends in emissions by region and country, some of which are shown in Table 1.

**Table 1**  
**Carbon Dioxide Emissions (Million Tonnes of CO2)**

<b>REGION/COUNTRY</b>	<b>2009</b>	<b>2019</b>	<b>CHANGE</b>	<b>CHANGE (%)</b>
<b>NORTH AMERICA</b>	6226	5976	-250	- 4.0
<i>USA</i>	5289	4965	-324	- 6.1
<i>CANADA</i>	504	556	+52	+10.3
<i>MEXICO</i>	434	455	+21	+4.8
<b>SOUTH/CENTRAL AMERICA</b>	1097	1255	+158	+14.4
<i>BRAZIL</i>	351	441	+90	+25.6
<b>EUROPE</b>	4574	4111	-463	-10.1
<b>CIS</b>	1876	2085	+209	+11.1
<i>RUSSIA</i>	1445	1533	+88	+6.1
<b>MIDDLE EAST</b>	1658	2164	+506	+30.5
<i>IRAN</i>	517	671	+154	+30.0
<b>AFRICA</b>	1070	1309	+239	+22.3
<b>ASIA/PACIFIC</b>	13245	17270	+4025	+30.4
<i>CHINA</i>	7710	9826	+2116	+27.4
<i>INDIA</i>	1596	2480	+884	+55.4
<i>JAPAN</i>	1130	1123	-7	-0.6
<i>SOUTH KOREA</i>	534	639	+105	+19.7
<i>THAILAND</i>	237	302	+65	+27.4
<b>OECD</b>	12508	12012	-496	-4.0
<b>NON-OECD</b>	17238	22157	+4919	+28.5
<b>WORLD</b>	29745	34169	+4424	+14.9

*Source: BP Statistical Review of World Energy, 2020*

Of the many observations one could draw from this table, the following perhaps stand out the most:

- **By 2019, the non-OECD region produced 65% of the world's emissions and its emissions growth over the last 11 years was almost 10 times the reduction in emissions achieved at great cost by the OECD countries.**
- **The Asia/Pacific region as a whole is clearly the "leader" in determining emissions trends; the United States, with less than 15% of global emissions, is at best a bystander, as is Europe, with only 12% of global emissions.**
- **While China and India are the pacesetters in emissions growth, the countries of the Middle East and Southeast Asia are not far behind.**



## The Forces Driving Future Emissions Growth

There are many factors that will affect the future trends in GHG emissions. Those who predict with alleged assurance that the world can and will “decarbonize” within thirty years are ignoring the great complexities and uncertainties involved, as are they who insist that they definitely can foretell any alternative outcome. It may be possible, however, to list and generally assess the major factors likely involved. These are the trends in:

- Population
- Global and national incomes (with the related affect in terms of increases in the global middle classes)
- The carbon “intensity” of the world economy, meaning the amount of carbon dioxide emitted per unit of Gross Domestic Product in each country
- The rates at which new technologies affecting energy production and consumption will be commercialized and achieve widespread market penetration
- The role that governments can and will play in seeking to “manage the pace of transitions
- Where governments try to push against competitive market forces, the willingness of people to accept government central planning and control of energy systems, with the attendant sacrifices in terms of democratic freedoms and individual choice.

In a previous paper, I addressed the limits on the pace of technological transitions. See here for that paper:

<https://www.thegwpf.org/energy-policy-needs-to-transition-to-reality/>

The remainder of this paper will examine the trends in population, income and GHG emissions.

### Population and Demographics

The United Nations Department of Economics and Social Affairs occasionally publishes its analysis on world population prospects, as driven by birth rates, fertility rates, death rates, and life expectancy at birth. It produces a set of “Key Indicators” that offers a glimpse into how the world population, and those of various regions, will change in the period to 2050 and beyond.

Consider the distribution of population by region in 2019 as shown in Table 2.

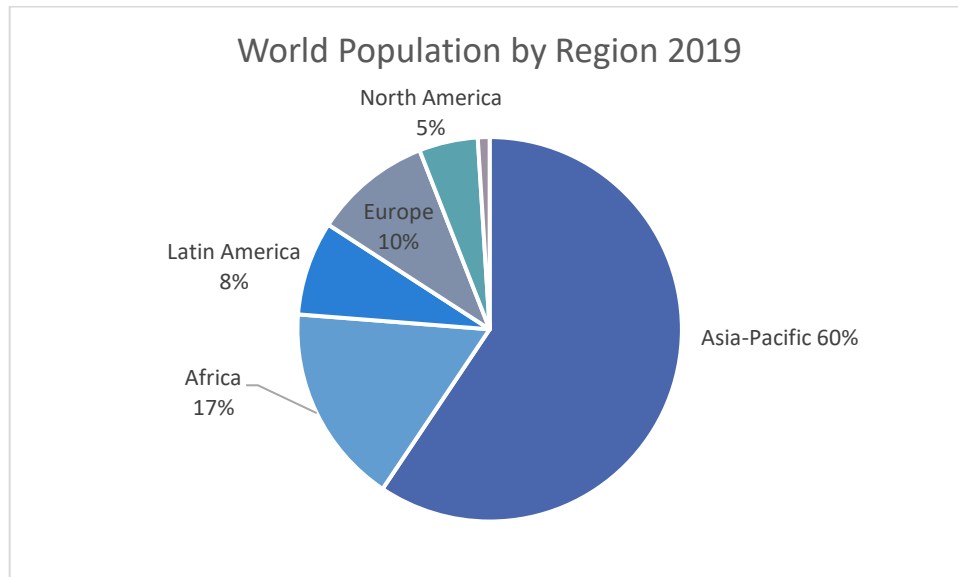
**Table 2**

**World Regions by Population in 2019**

<b>Region</b>	<b>Populations (thousands)</b>	<b>Percentage of Globe</b>
<b>Africa</b>	1,308,064	17
<b>Asia</b>	4,601,371	60
<b>Europe</b>	747,303	10
<b>Latin America</b>	648,121	8
<b>North America</b>	366,601	5
<b>Oceania</b>	42,128	1
<b>World</b>	7,713,468	100

Source: United Nations

Here is the same information in pie-chart form.



**Many people, especially in Europe and North America, may not be aware that their combined populations are only 15% of the world's total, that the population of Africa exceeds that combined total and that the population of Asia is four times that large.**

Based on the U.N's analysis, the regional populations and their differences are about to change considerably during the early adulthood of a child born today. Table 3 shows the projected population totals and regional shares in 2050.

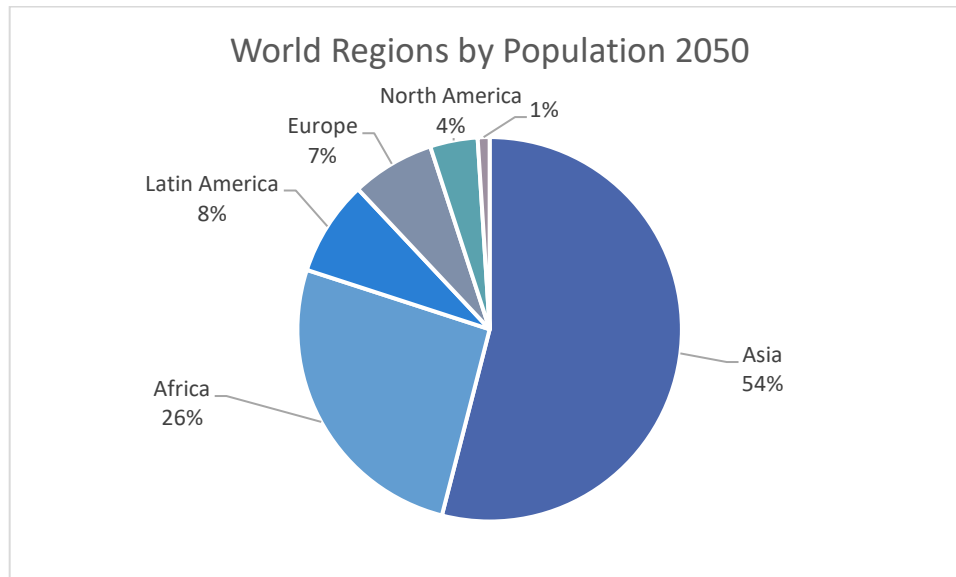
**Table 3**

**World Regions by Population in 2050**

<b>Region</b>	<b>Populations (thousands)</b>	<b>Percentage of Globe</b>
<b>Africa</b>	2,489,275	26
<b>Asia</b>	5,290,263	54
<b>Europe</b>	710,486	7
<b>Latin America</b>	762,432	8
<b>North America</b>	425,200	4
<b>Oceania</b>	57,376	1
<b>World</b>	9,735,034	100

Source: United Nations

Here is the same information in pie-chart form.



A comparison on Tables 2 and 3 illustrates four important changes:

- **By 2050, the world population is projected to grow by more than two billion people.**
- **Almost all of that growth will occur in Asia and Africa which, by 2050, will hold 80% of the world's population.**
- **The population of Europe is projected to decline by about 37 million, largely due to depressed birth rates and low fertility rates.**
- **The combined population of Europe and North America will be only 11% of the world total.**

There will also be important changes in demographics. Already, 19% of the population in Europe is 65 years of age or older, as is 16% of the population in North America, while those under 25 years of age are 26% and 31% respectively. In contrast, in Asia, the share of people aged 25 and under is slightly higher at 39%, but in Africa it is 60%.

## Economic Growth

One might shrug off the differences in population and demographics as “old news”. After all, have not the populations of Asia and Africa far exceeded those of “the west” for generations? Have the high populations not, in fact, been a source of weakness due to the challenges of feeding so many mouths and employing so many workers? Won’t per capita incomes in the OECD countries stay higher than those in the developing countries and give “the west” an enduring advantage that will allow it to maintain political, economic, and strategic leadership? To gain some insight into the answers to those questions, it is helpful to look to a private sector source of expertise, Price Waterhouse Cooper (PWC).

In a 2017 report, PWC offered some insights into how the global economy might change by 2050.<sup>1</sup> The report was based on growth projections for 32 of the largest economies in the world, accounting for 85% of world GDP. The key findings of the report are summarized below:

***The world economy could more than double in size by 2050, far outstripping population growth, due to continued technology-driven productivity improvements.***

***Emerging markets (E7) could grow around twice as fast as advanced economies on average. (The E7 countries are China, India, Brazil, Russia, Indonesia, Mexico, and Turkey. The G7 countries are the United States, Germany, Japan, the United Kingdom, France, Italy, and Canada.)***

***As a result, six of the seven largest economies in the world are projected to be emerging economies in 2050 led by China, India, and Indonesia.***

***The United States could be in third place in the global rankings while the EU27’s (European Union) share of world GDP could fall below 10% by 2050.***

***Emerging economies need to enhance their institutions and their infrastructure significantly if they are to realize their long-term growth potential.***

The PWC analysis ranks the countries of the world by projected income. The following figure shows the rankings for the top 10 countries in 2016 and in 2050.

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<sup>1</sup> *The Long View: How will the global economic order change by 2050?*, PC, February 2017

<https://www.pwc.com/gx/en/world-2050/assets/pwc-world-in-2050-summary-report-feb-2017.pdf>

**Emerging markets will dominate the world's top 10 economies in 2050 (GDP at PPPs)**

	2016	2050	
China	1	1	China
US	2	2	India
India	3	3	US
Japan	4	4	Indonesia
Germany	5	5	Brazil
Russia	6	6	Russia
Brazil	7	7	Mexico
Indonesia	8	8	Japan
UK	9	9	Germany
France	10	10	UK

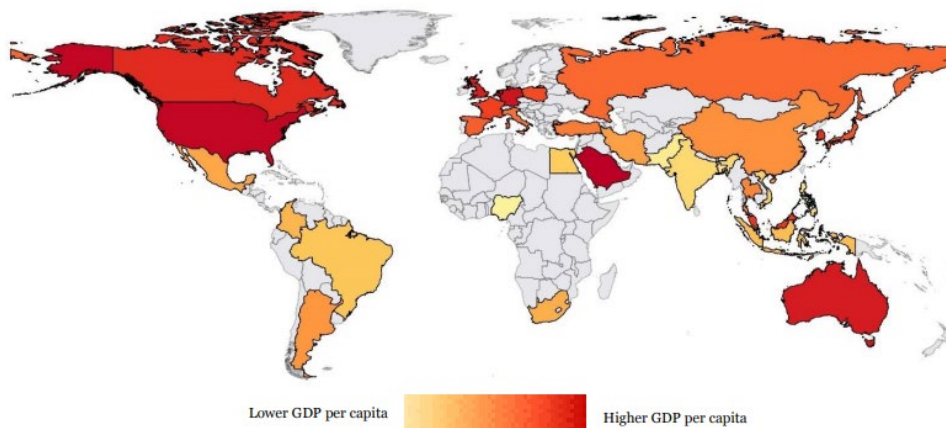
E7 economies
  G7 economies

So, according to the PWC analysis, by 2050 China and India will be the largest economies and Indonesia, Brazil and Mexico will surpass Japan, Germany, and the United Kingdom. In the ranking of the top 32, Saudi Arabia (13), Nigeria (14), Egypt (15), Pakistan (16), Philippines (19) and even Vietnam (20) would surpass Canada (22).

One might debate PWC's assumptions and conclusions, but most of its analysis seems highly credible. It certainly is very possible, and indeed probable, that higher global population will coincide with fast rising incomes, especially in the countries among which population is rising the fastest. The economic growth will be aided by new technologies, but with a pre-condition, i.e., that developing countries will have to establish institutional

frameworks that will allow technology and enterprise to flourish. Among other things, they will have to establish property rights and the rule of law, and they must find ways to allow women to achieve their potential through higher education and higher participation in the economy.

**Map 1: Projected real GDP per capita in 2050**



Source: PwC analysis

**Although not addressed by PWC, I would argue there is another essential precondition to fast growth in the emerging economies, one that the leaders in those countries have already acknowledged by their actions, if not by their words. The individual and industry energy consumers must have the ability to use the lowest cost and most secure and reliable energy sources available, as determined by market competition, not by government dictates. The enormous growth anticipated will mean that there will be a demand for all sources of energy supply. In many cases, but especially in most of Asia, the Middle East and Africa, that means continued and increased use of coal, oil, and natural gas. The billions of people now living in those**

**regions and the billions more who will be born there in the next 30 years cannot, and will not, be constrained from making sensible economic choices by the climate policy preferences of those in the west who already enjoy high incomes and living standards. The global dog will not be waged by the ever smaller G7 tail.**

## Implications for Greenhouse Gas Emissions

As previously indicated in Table 1, the emerging economies have over the last eleven years increased their GHG emissions at a rapid pace. With the projected growth in population and income, how will emissions change in future? The International Energy Agency, once noted for its detached and professional analysis of energy markets and energy security issues, has become an advocate of “decarbonization”. Its recent World Energy Outlooks, while presenting a broad range of scenarios, have focused on the ones that support the thesis that global “decarbonization” will occur by 2050. The IEA has especially raised questions as to whether the demand-depressing effects of the COVID-19 pandemic will have permanent consequences for energy markets.

**The United States Energy Information Administration (EIA), until now, has retained a more detached view of energy markets in its annual International Energy Outlooks. The 2019 version of the EIA Outlook<sup>2</sup> provides an analysis not only of the likely emissions trends but also of the underlying sectoral and fuel-specific factors that may most influence those trends.**

Some of the most notable of the EIA’s projections relating to fuels and sectors are these:

- End-use energy consumption by fuel will grow steadily throughout the period to 2050, with the largest growth in the industrial sector, followed by transportation.
- The industrial sector, which includes refining, mining, manufacturing, agriculture and construction, accounts for more 50% of end-use energy consumption during the entire projection period. Driven by developments in the non-OECD area, world industrial sector energy use increases by more than 30% from 2018 to 2050, reaching about 315 quadrillion British thermal units (Btu) by 2050.
- Led by India, industrial use of coal in non-OECD Asia increases after the mid-2020’s. By 2050, more than two-thirds of worldwide industrial coal is consumed in India and China.
- Most of the growth in energy use for transportation arises from passenger travel, not freight movement, and virtually all of it occurs on the non-OECD area. Higher incomes and much higher motorization rates<sup>3</sup> drive this trend. From 2018 to 2050, non-OECD energy consumption in light-duty vehicles increase energy consumption by 17 quadrillion Btu.

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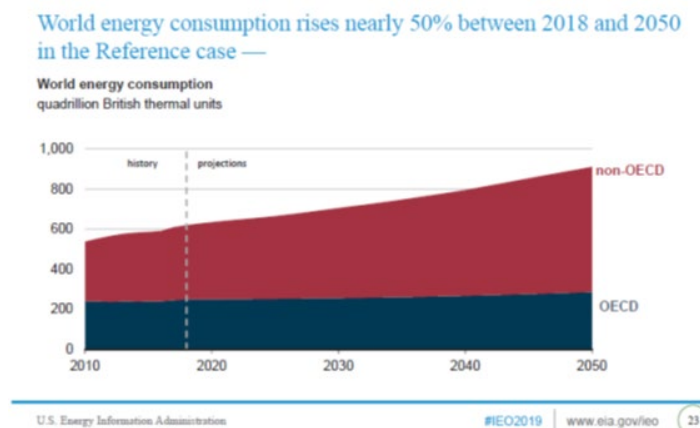
<sup>2</sup> <https://www.eia.gov/outlooks/archive/ieo19/pdf/ieo2019.pdf>

<sup>3</sup> Motorization rates refer to the number of motorized vehicles per thousand people in a country.

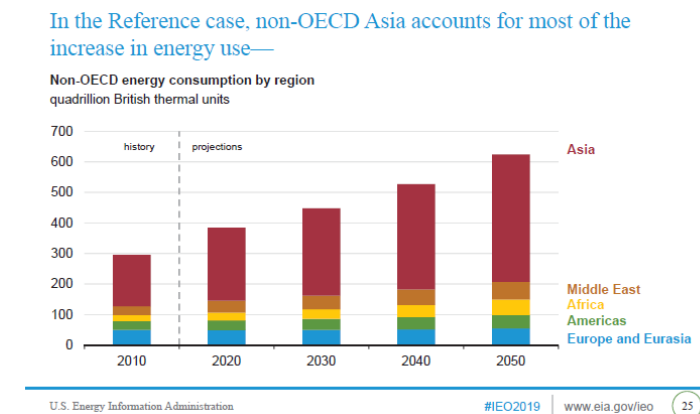
- Within the transportation sector, the use of petroleum and other liquid fuels increases through 2050, but its share of transportation fuels declines from 94% to 82%.
- World petroleum and other liquid fuels consumption increases by 45% in the non-OECD from 2018 to 2050, from about 108 quadrillion Btu to 156 quadrillion Btu by 2050.
- Non-OECD Asia accounts for most of the growth in natural gas consumption from 2018 to 2050, growing by more than 45 quadrillion Btu.

**Overall, the 2019 EIA Outlook projected world energy consumption to rise nearly 50% between 2018 and 2050, due almost entirely to strong economic growth, increased access to marketed energy, and rapid population growth in the non-OECD countries.**

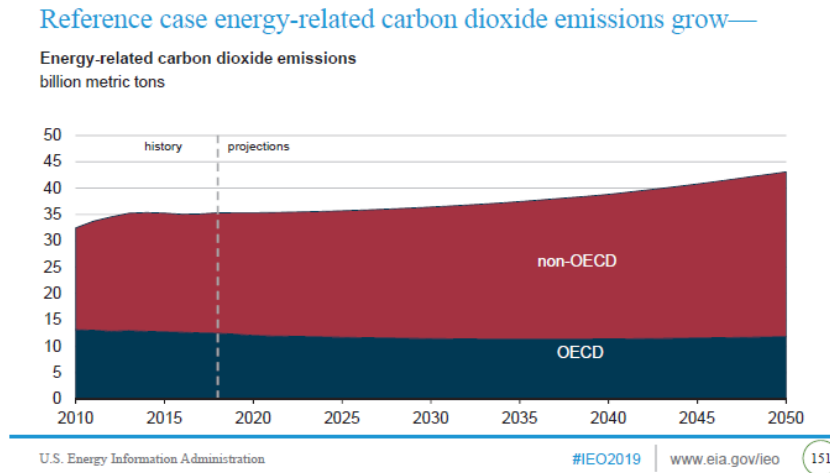
Here is the graph illustrating this:



The following bar chart illustrates the EIA's projected growth in energy consumption by region of the world, showing the dominant role of Asia and the Middle East.



The consequences of this for global GHG emissions are illustrated in the following graph. World energy-related CO2 emissions are projected to grow at an average rate of 0.6% per year between 2018 and 2050, with the rate of growth in the non-OECD countries at about 1% per year. In other words, the EIA projects global CO2 emissions to grow from about 34 billion tonnes in 2018 to 43 billion tonnes in 2050.



This is a long, long way from the “net zero emissions” targets that environmental groups and some western governments are imposing on their citizens. If such emissions reductions were feasible, and if all OECD countries attained them, but emissions growth continued in the non-OECD as now projected, by 2050 global emissions would be about 29 billion tonnes per year, only 16% below the 34.2 billion tonnes of global emissions in 2019.

## Conclusion

The countries of Europe and North America are not in decline. They still enjoy some of the highest levels of income per capita in the world and great potential for future improvement in standards of living and quality of life. However, whatever “leadership” they may have enjoyed in the past is fast being overtaken by the economic and population growth in the non-OECD countries and especially in Asia. These developments are far more important than the policies or personalities of any western leader.

Just as China has over the past few decades taken its place as one of the largest and fastest growing economies in the world, a number of other “giants” are waiting in the wings, ready to take their places among the centres of global economic activity, with standards of living that approach those in the G7 countries today. Those waiting giants notably include India, Indonesia, Brazil, Mexico, Saudi Arabia, and Nigeria. Their rapidly increasing populations and economies will require much more energy, including the hydrocarbons like coal, oil,



and natural gas the countries of the west relied on during their ascents to prosperity and world influence.

**Can a group of western governments possibly constrain and even reverse the demand for more and better energy services arising from population and income growth in the 80% of the world they do not govern?**

Never in history have governments tried to severely limit the use of commodities that the public demands and that are progressively more plentiful and affordable.

Some emerging giants stand in the way of that happening now.



### *About the Author*

**Robert Lyman** is an economist with 27 years' experience as an analyst, policy advisor and manager in the Canadian federal government, primarily in the areas of energy, transportation, and environmental policy. He was also a diplomat for 10 years. Subsequently he has worked as a private consultant conducting policy research and analysis on energy and transportation issues as a principal for Entrans Policy Research Group. He is a frequent contributor of articles and reports for Friends of Science, a Calgary-based independent organization concerned about climate change-related issues. He resides in Ottawa, Canada. [Full bio.](#)

### *About Friends of Science Society*

Friends of Science Society is an independent group of earth, atmospheric and solar scientists, engineers, and citizens that is celebrating its 18th year of offering climate science insights. After a thorough review of a broad spectrum of literature on climate change, Friends of Science Society has concluded that the sun is the main driver of climate change, not carbon dioxide (CO<sub>2</sub>).

Friends of Science Society

P.O. Box 23167, Mission P.O.

Calgary, Alberta

Canada T2S 3B1

Toll-free Telephone: 1-888-789-9597

Web: [friendsofscience.org](http://friendsofscience.org)

E-mail: [contact@friendsofscience.org](mailto:contact@friendsofscience.org)

Web: [climatechange101.ca](http://climatechange101.ca)

