

HONR 229L: Climate Change: Science, Economics, and Governance

Discussion #5: China, The Lurching Giant

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Class Web Site: <http://www.atmos.umd.edu/~rjs/class/honr229L>

ELMS Page: <https://myelms.umd.edu/courses/1269254>



<https://www.reuters.com/article/us-china-usa/obama-urges-china-to-be-partner-in-ensuring-world-order-idUSKCN0IU16C20141110>

17 September 2019

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AT 4, Q 1:

The variation in forest cover between the Dominican Republic and Haiti is paralleled by differences in what?

The variation in forest cover between the two countries is paralleled by their economic differences. Haiti is significantly poorer and more overpopulated than the Dominican Republic, and the amount of forest cover Haiti has is significantly less than that of the Dominican Republic, due in part to poorer people using those resources to make charcoal.

Haiti's soil was composed of more limestone, making it drier and less fertile than the Dominican Republic soils that receive more rainfall. This means that **once trees were removed and the land was used for economic gain like sugar plantations in Haiti, the forests were less likely to ever be able to recover.**

The deforestation that occurred in Haiti has sadly relegated the inhabitants to a bleak economic situation.

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AT 4, Q 2:

How did the presence of gold and the suitability of being a good locale for the growth of sugar cane affect the people of Hispaniola, following the arrival of Christopher Columbus in 1492?

The presence of gold was a strong detriment to the people of Hispaniola after the arrival of Christopher Columbus in 1492. The availability of gold in the land was attractive to the Europeans, however the **luster of the gold meant that the Europeans virtually enslaved the native population** to mine the gold for their own gain. With this came the spreading of Eurasian diseases, where through enslavement and the spreading of foreign diseases, the Europeans essentially murdered off the population, reducing a population that was once 500,000 to a mere 11,000, and then further to a measly 3,000. The suitability of being a good locale for growing **sugar cane came with similar negative effects**, as slaves from Africa were imported to Hispaniola, and therefore more diseases were spread to the area and due to neglect by Spain and political conflict, the people of Hispaniola to suffer greatly.

Sad chain of events with a tragic outcome on so many levels.

The population of Haiti was too large and disorganized, and the land too spoiled when the French left, for the people to have a realistic chance at a successful outcome from an economic point of view. Had the land not been so deforested and the soils not so depleted due to the production of sugar, the people would have had half a chance of developing their economy, despite starting with a large disorganized population.

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AT 4, Q 3:

The Haitian side of the island had less environmental advantages than the Dominican side of the island, but developed a rich agricultural economy before the Dominican side. In a few sentences, describe how this happened and state whether or not it *foreshadowed* events to later transpire.

The reason for the early prosper of Haiti came from the stronger power of France, which dominated Haiti, that invested on bringing slaves and developing plantations on the island. This overwork of a rich island can be seen as foreshadowing of the current state of the land, but both countries are not doing very well ...

Understandable how one might reach this conclusion, given what is written in the book plus the sordid headlines that emerged from the Dominican Republic over the summer. Let's take a look at some economic data:

Public Data

- World Development Indicators
 - Economic Policy and Debt
 - Adjusted net national income (ann...
 - Adjusted net national income (con...
 - Adjusted net national income (curr...
 - Adjusted saving (% of GNI)
 - Adjusted saving (current US\$)
 - Aid flows at constant US\$
 - Aid flows at current US\$
 - Average grace period on new exte...
 - Average grant element on new ext...
 - Average interest on new external ...
 - Average maturity on new external ...
 - Balance of Payments (ratios to G...
 - Balance of payments current acco...
 - Changes in net reserves (BoP, cur...
 - Concessional debt (% of total exte...
 - Currency composition of Public an...
 - Debt Interest arrears
 - Debt Interest rescheduled (capitali...

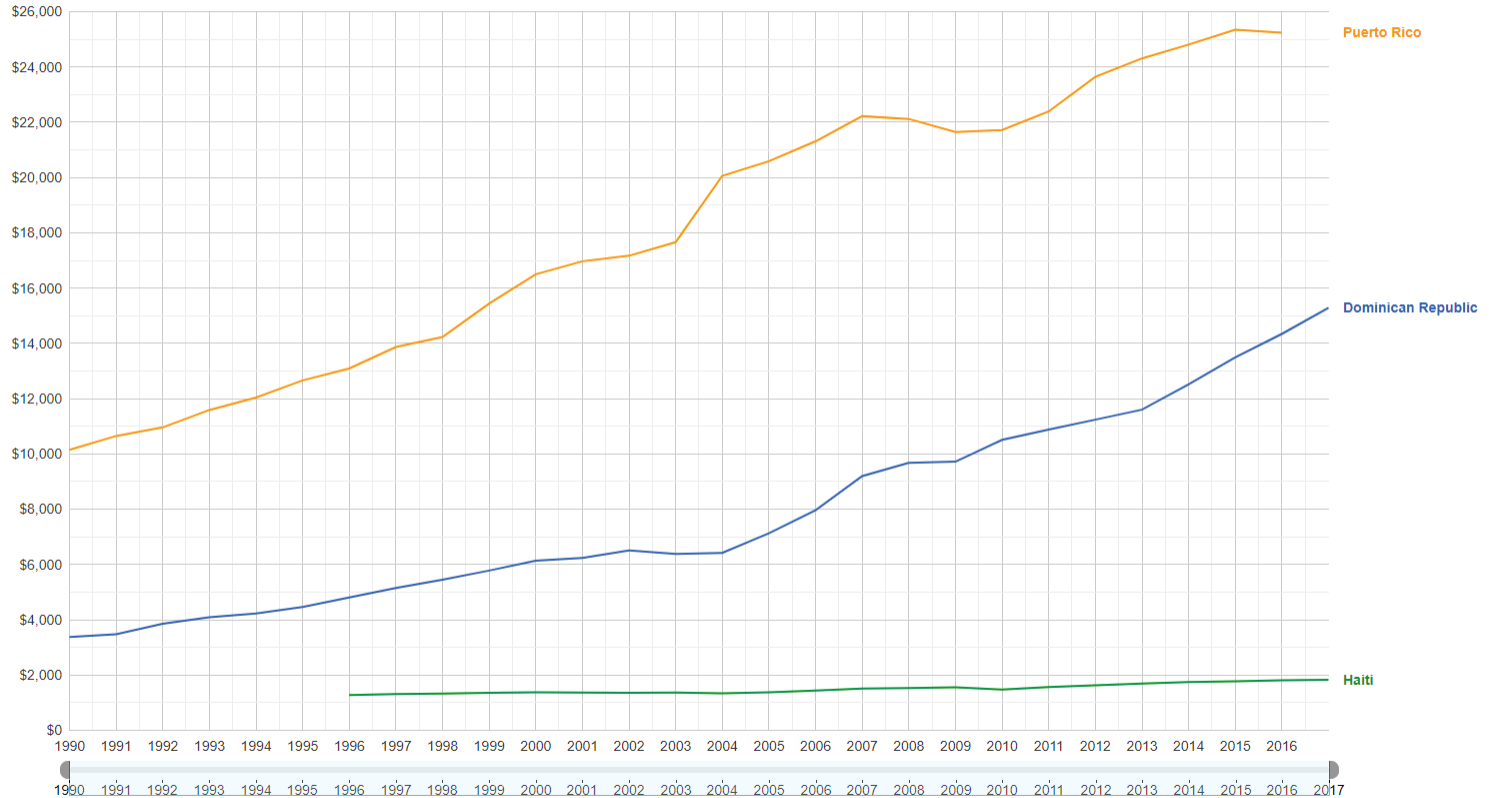
Clear

Compare by Region

- British Virgin Islands
- Cayman Islands
- Chile
- Colombia
- Costa Rica
- Cuba
- Curaçao
- Dominica
- Dominican Republic
- Ecuador
- El Salvador
- Grenada
- Guatemala
- Guyana
- Haiti
- Honduras
- Jamaica
- Mexico
- Nicaragua
- Panama

Clear selections

GNI per capita in PPP dollars ?



Data from World Bank Last updated: Jul 6, 2018

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<https://www.google.com/publicdata/explore>

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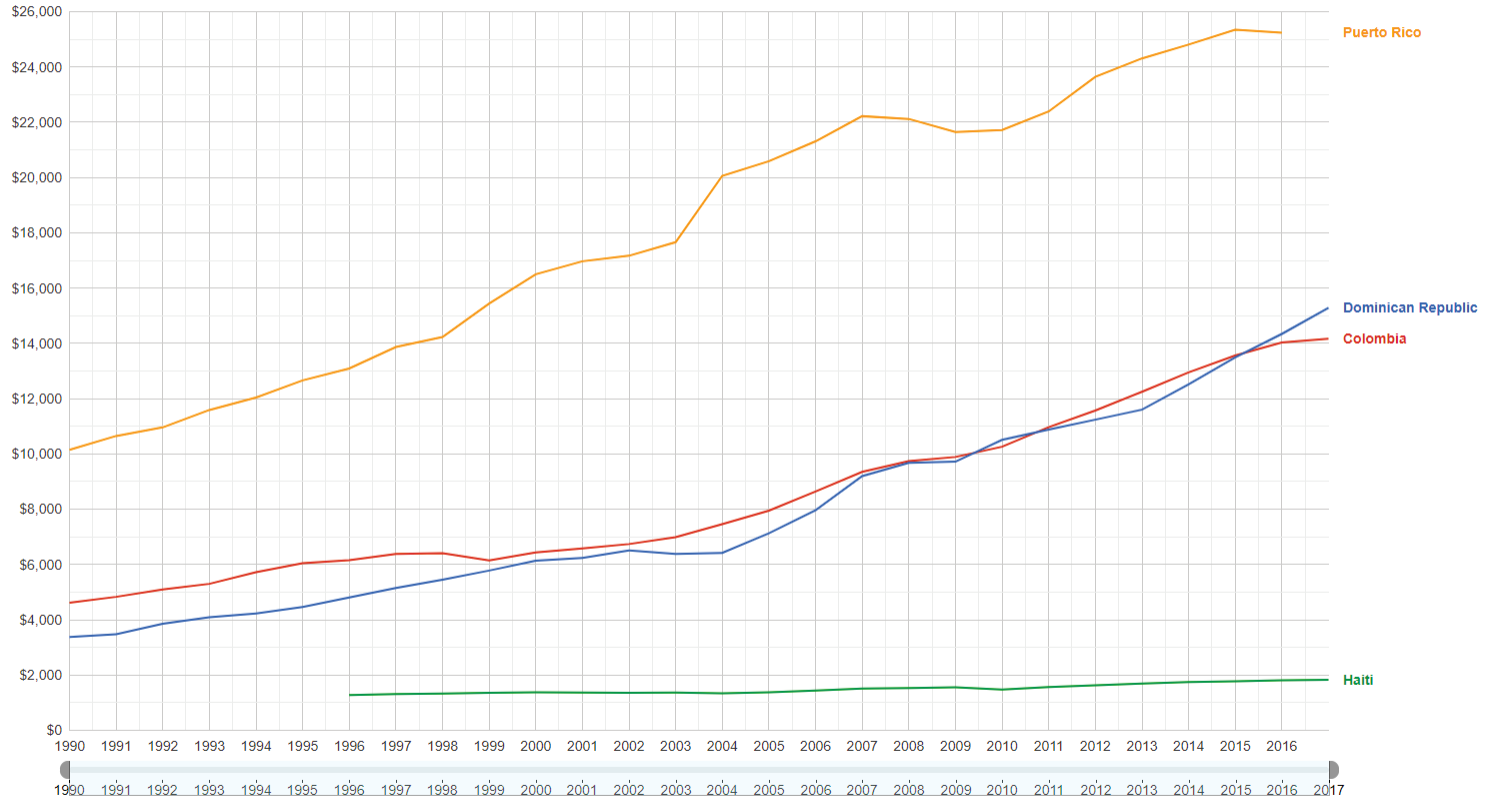
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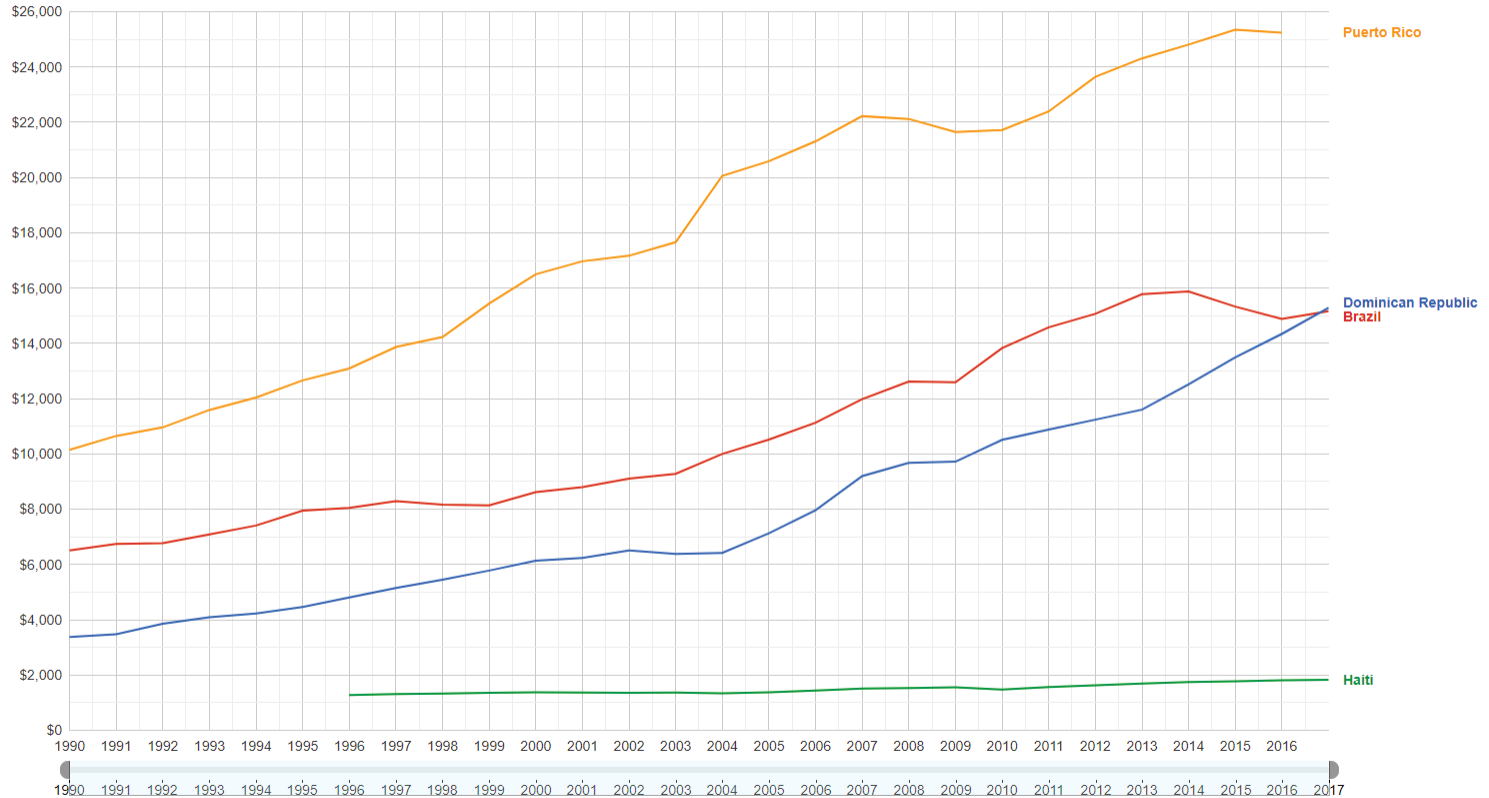
Clear

Compare by Region

- Argentina
- Aruba
- Barbados
- Belize
- Bolivia
- Brazil
- British Virgin Islands
- Cayman Islands
- Chile
- Colombia
- Costa Rica
- Cuba
- Curaçao
- Dominica
- Dominican Republic
- Ecuador
- El Salvador
- Grenada
- Guatemala
- Guyana

Clear selections

GNI per capita in PPP dollars ?



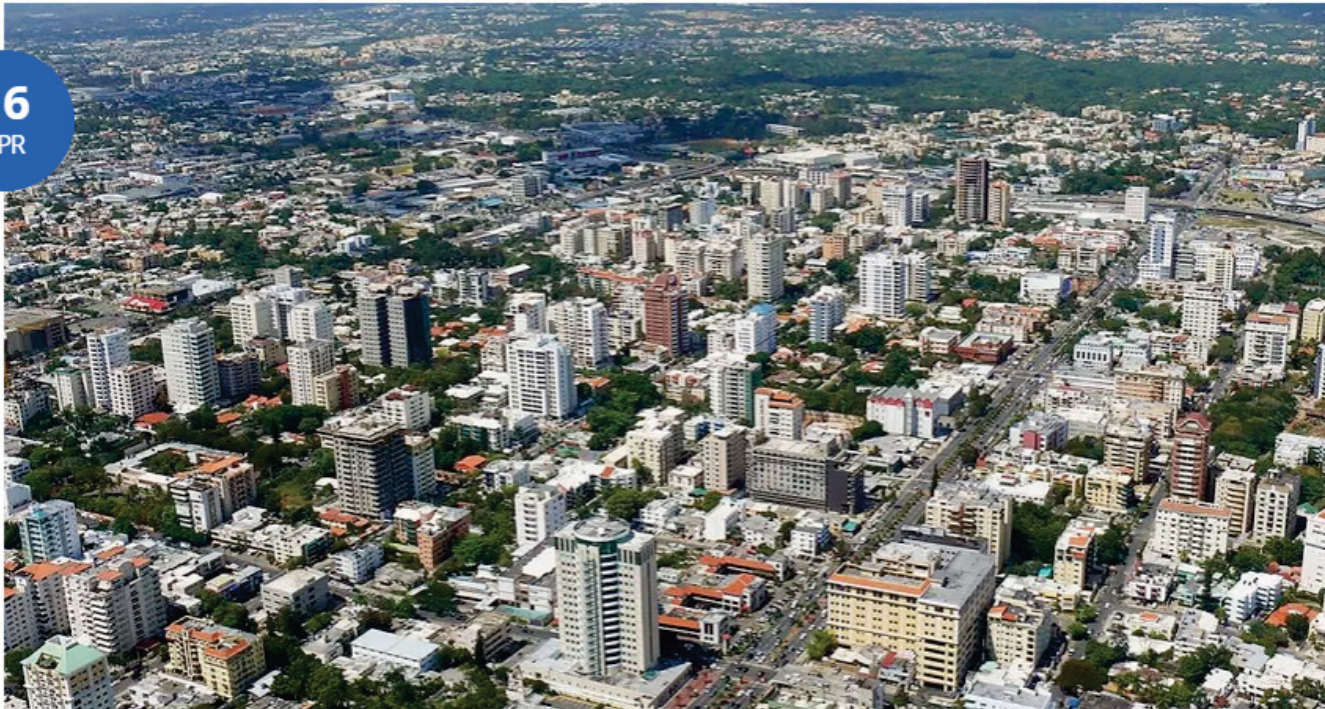
Data from World Bank Last updated: Jul 6, 2018

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<https://www.google.com/publicdata/explore>

Santo Domingo, Dominican Republic

16
APR



Is Santo Domingo The World's Next Big Property Market?

👤 Posted by Lief Simon 📁 In [Real Estate](#) 💬 0 comment

The economy in the Dominican Republic has been the fastest, or one of the fastest growing economies in Latin America for the last five years.

<https://www.offshorelivingletter.com/is-santo-domingo-the-worlds-next-big-property-market/>

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AT 4, Q 3:

The Haitian side of the island had less environmental advantages than the Dominican side of the island, but developed a rich agricultural economy before the Dominican side. In a few sentences, describe how this happened and state whether or not it *foreshadowed* events to later transpire.

The Dominican Republic and Haiti have two different environmental outcomes due to governmental differences. Although both countries were former colonies and both have been under a dictator regime, one has prospered economically and established measures to save its environment whereas the other struggles with overpopulation and poverty. The Dominican Republic is much more advanced than Haiti first due to dictator Rafael Trujillo, who developed the country's economy, infrastructure, industries, and reserve systems, and then due to President Balaguer who furthered the Republic's environmental management. In contrast, *Haiti* did not develop economically, even under dictator "Papa Doc", and instead *has a history of political instability and poverty.* Haiti's lack of a solid government leaves its problems like overpopulation and poverty unsolved and the two issues continue to contribute to environmental damage (which also goes unchecked). In essence, the **differences in outcomes between the Dominican Republic and Haiti are a result of the varying responses by their governmental leaders.**

Very nicely stated: Diamond is certainly hoping you will focus on the role of government leaders.

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AT 4, Q 4:

Write a paragraph, with a strong topic sentence, explaining why the outcomes were so different for the Dominican Republic and Haiti. Try to keep to 4 to 6 sentences.

The Dominican Republic and Haiti have such differing outcomes today because of the different priorities of the dictators that ruled each country. The Dominican Republic had Rafael Trujillo and Joaquin Balaguer, who poured heavy resources into both modernizing the Dominican economy and protecting the Dominican environment. Balaguer, in particular, bought up significant amounts of land to preserve as national parks, imported propane and liquid natural gas instead of using charcoal from Dominican forests, and banned logging in the country. He was rewarded for this with big beautiful forests and better river flow that enabled him to construct hydroelectric dams, and despite these environmental protections being weakened today, the Dominican Republic still has a strong, grassroots environmental movement.

Excellent writing: appreciate the use of rich adjectives.

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By **Phillip Martin**

September 3, 2019

SHARE   



 LISTEN

The Other Border | Part 1

This is part 1 of a 2-part series titled "The Other Border." [Read part 2.](#)

Immigrants living in Massachusetts on "temporary protected status" (TPS) are beginning to head for the border as courts consider President Trump's plan to send them back to their home countries.

But it is not the southern border that beckons these immigrants. It is the Canadian border that is seeing a surge in out-migration from the U.S.

There are more than 300,000 immigrants nationwide who are in the U.S. on temporary protected status, a 1999 policy intended to protect foreign nationals living in the U.S. from being returned to their home country if it is unsafe. In 2017 and 2018, the Trump administration canceled TPS for Haiti, Nicaragua, El Salvador, Nepal, Honduras and Sudan. For thousands, the only things standing in the way of deportation are federal courts, which have blocked cancellations for these countries for the time being. But if a slew of pending lawsuits fail, many TPS holders, including at least 12,000 in Massachusetts, will need to consider their options.

<https://www.wgbh.org/news/local-news/2019/09/03/with-immigration-status-in-limbo-some-tps-holders-consider-heading-north-to-canada>

First Paper

- First Paper (**25 %** of final grade)
 - due **14 Nov** **BUT** can be completed well before due date!
 - 5 to 8 pages single spaced; must include references & can include figures, both of which are excluded from the page count
 - expands upon the topic of any class meeting, *other than* class meeting you have or will lead, or explores some other topic related to class
- Various stages for first paper:
 - Thurs, 19 Sept: **description** of paper due
 - <https://myelms.umd.edu/courses/1269254/quizzes/1287072>
- We are looking for a modest amount of independent research outside of the required readings rather than a summary of the required readings
 - Paper should include citations: can consult <http://lib.guides.umd.edu/citationtools> for info on various citation managers
 - Websites can be cited by either placing URL into reference list with an appropriate descriptive label: i.e. EPA, 2016: <https://www.epa.gov/criteria-air-pollutants/naaqs-table> or by using footnotes
 - Primary sources should be articles in magazines such as *Scientific American* or *Natural Geographic*, journal articles, government reports, or book chapters

This Thursday

- Please provide a brief description of your paper, including:
 - a) the topic
 - b) resources to be used as source material for the paper
- “Paper Desc” assignment due 19 Sept; can find link to this assignment on either <https://myelms.umd.edu/courses/1269254> or <http://www.atmos.umd.edu/~rjs/class.honr299L>
- Paper should include citations:
 - websites can be cited (should place URL into reference list) but should not rely solely on websites please this is not particularly “scholarly”
 - primary sources of information should be published papers, articles in magazines such as *Scientific American* & *Natural Geographic*, or reports issued by reputable groups

If you’d like to use the material in Diamond’s book as your starting point, and are struggling to find additional source material, please note:

- a) **Further Readings** section for each chapter at back of book
- b) Google Scholar <https://scholar.google.com> and Web of Knowledge <http://apps.webofknowledge.com> are excellent resources
- c) If a website would like to charge \$\$\$ for article, please first check for free access from campus. If can’t obtain for free, then let me & Walt know

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Citation Guide

Welcome to use *either* the author year system that inserts information into the text in one of two ways:

While some assert that the essential qualities a politician must possess are passion, a feeling of responsibility, and a sense of proportion (Smith, 2016), others believe...

-or-

While Smith (2016) asserted the essential qualities a politician must possess are passion, a feeling of responsibility, and a sense of proportion others believe

or a numbered endnote system:

While some assert that the essential qualities a politician must possess are passion, a feeling of responsibility, and a sense of proportion¹², others believe...

-or-

While Smith¹² asserted the essential qualities a politician must possess are passion, a feeling of responsibility, and a sense of proportion, others believe

Note a paper by Smith, Jones, and Brown would be cited as Smith *et al.* (1946),
a paper by Smith and Jones would be cited as Smith and Jones (1946)

See <https://www.lib.umd.edu/rc/citation-tools> for a wealth of additional info

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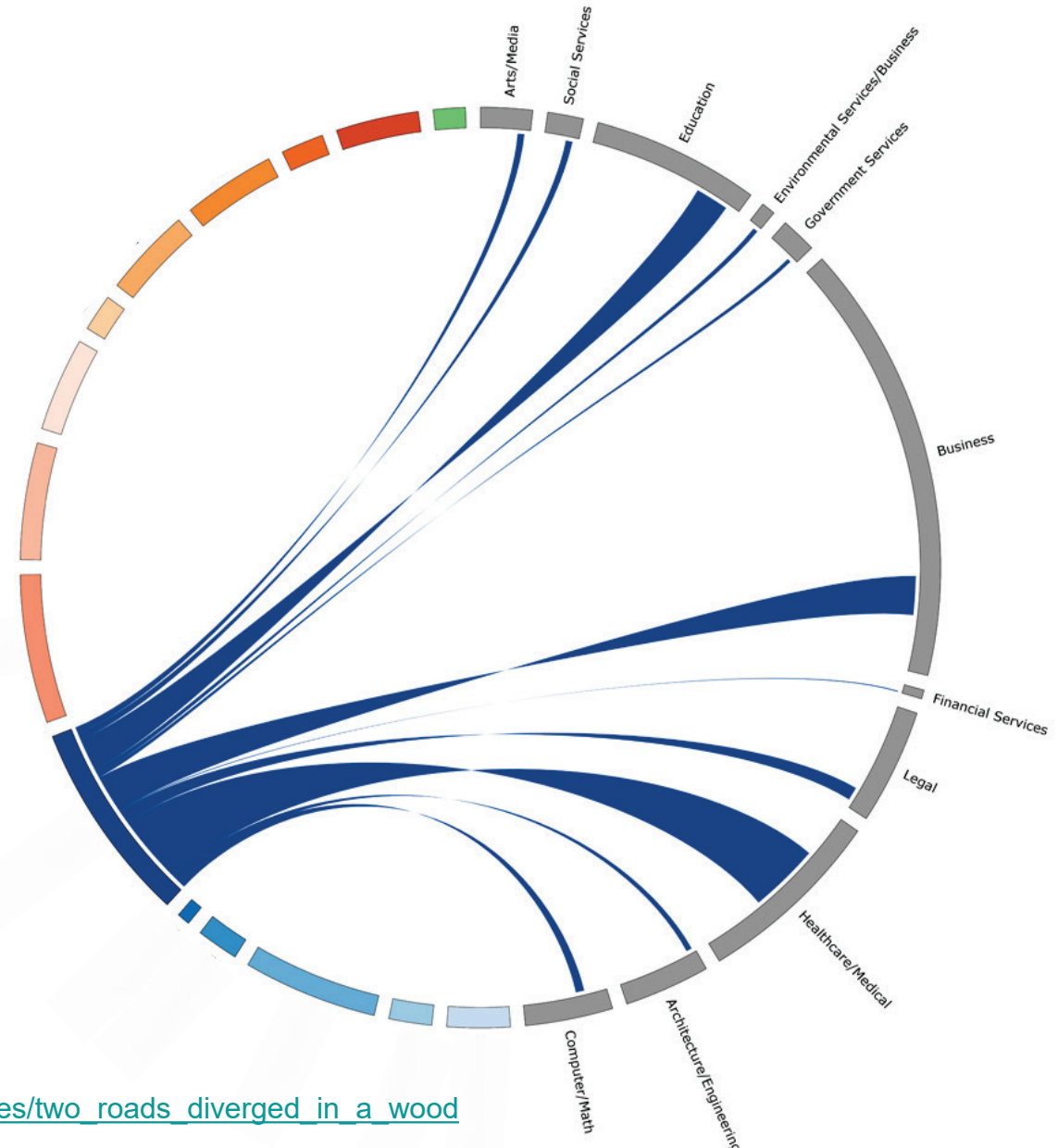
Impact of major on occupation:

Two roads diverged in a yellow wood,
And sorry I could not travel both/and be one traveler, long I stood
and looked down one as far as I could...

The Road Not Taken, Robert Frost

http://uvamagazine.org/articles/two_roads_diverged_in_a_wood

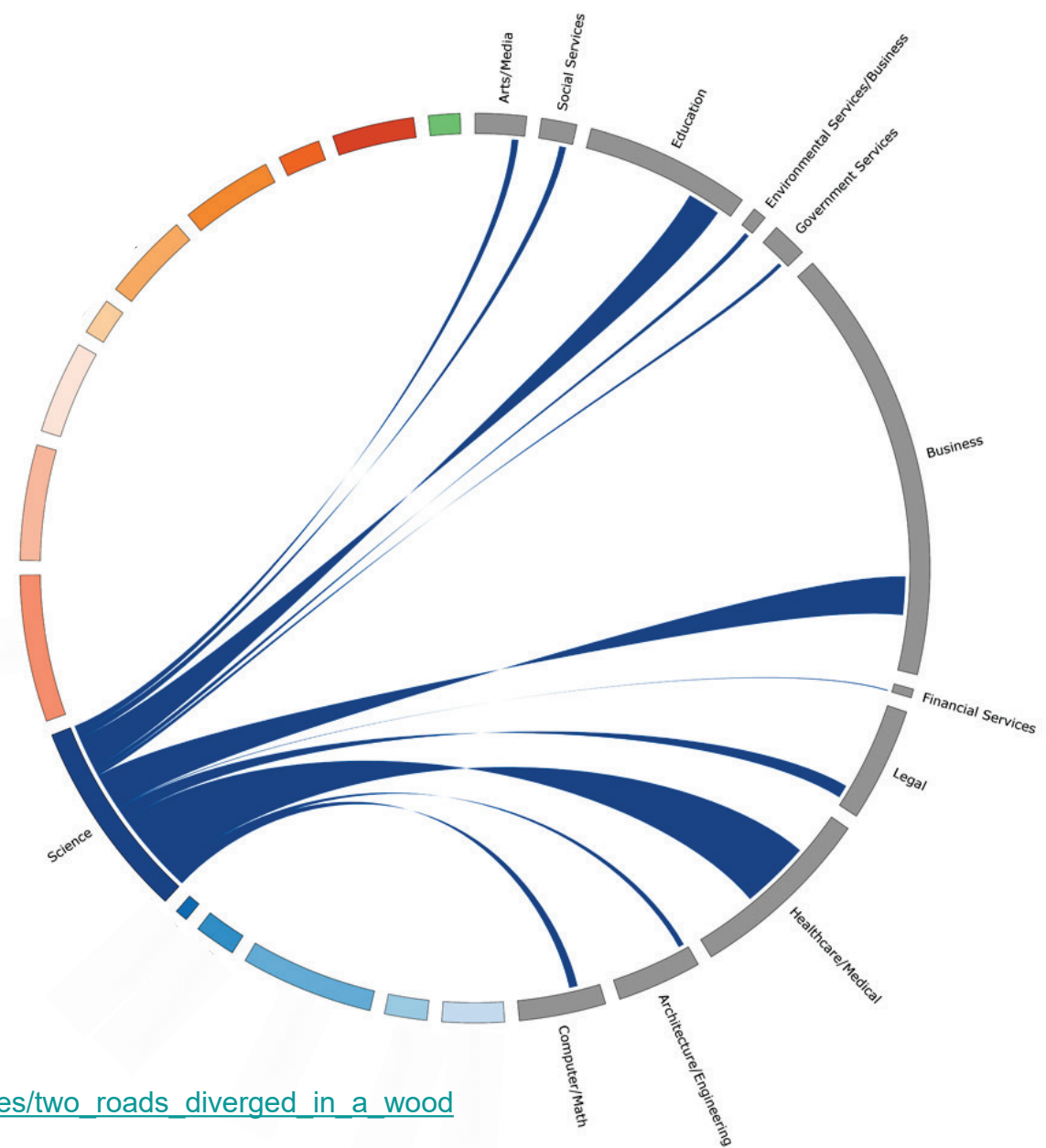
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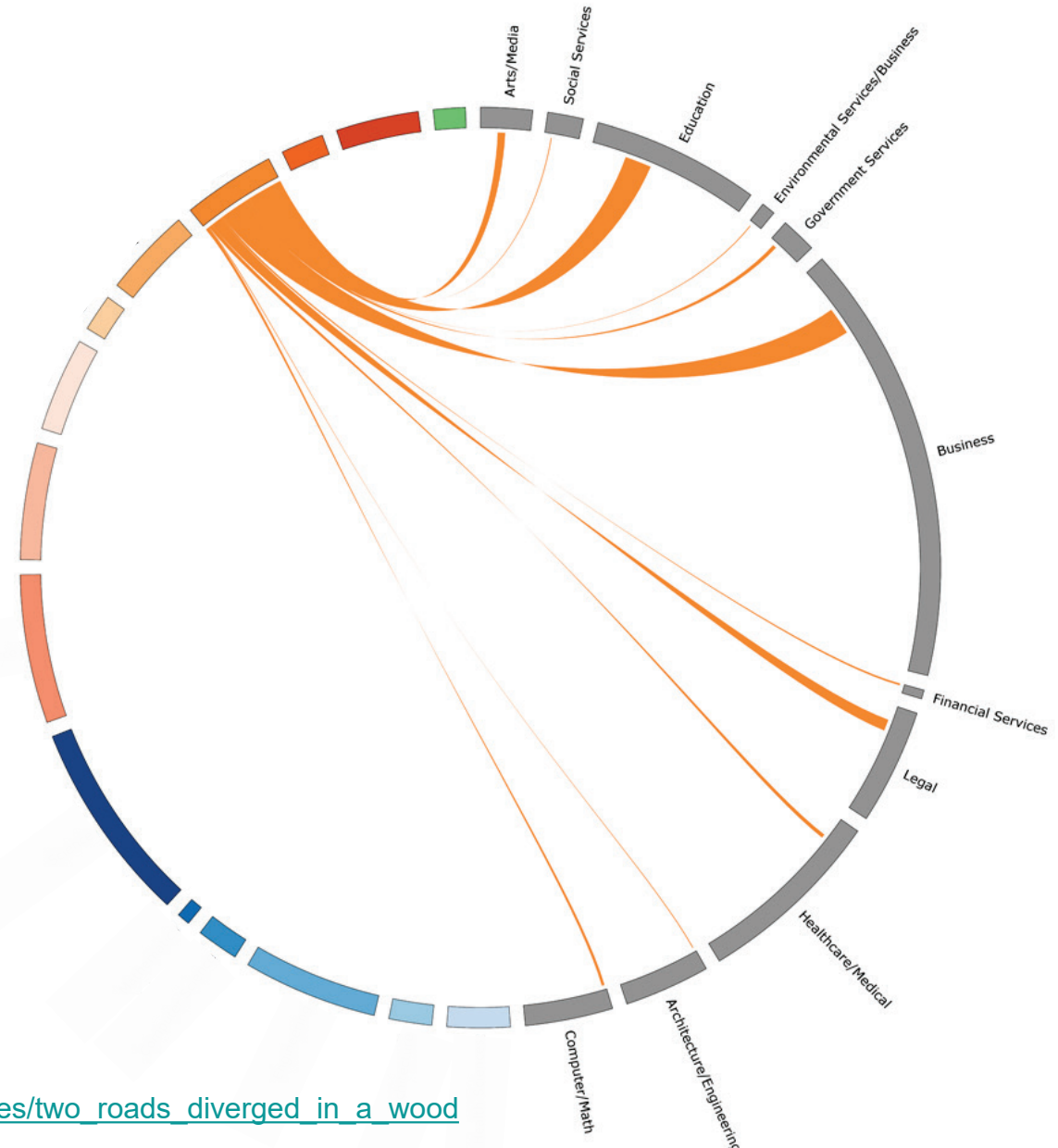
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Impact of major on occupation:



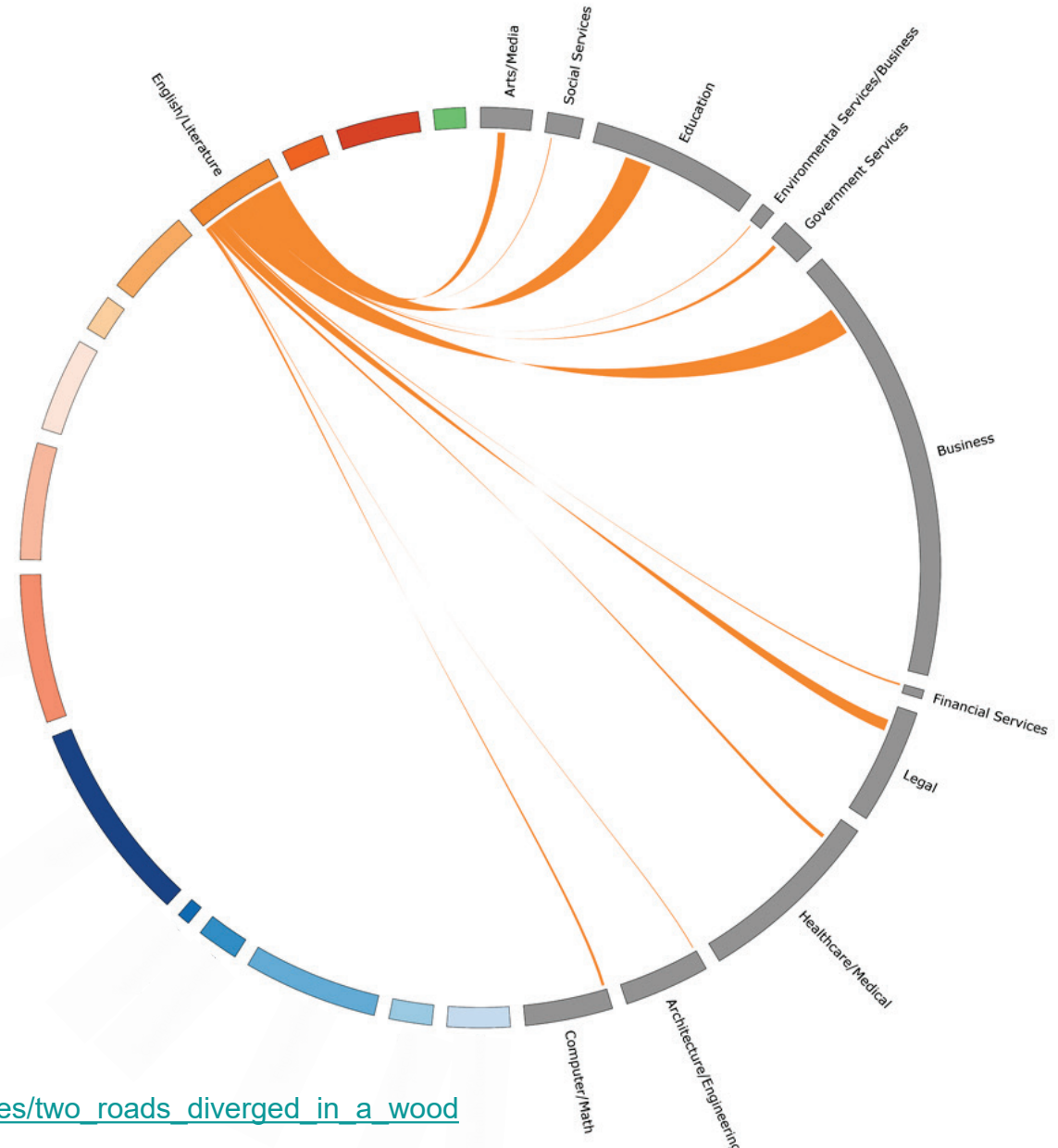
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“China, Lurching Giant”

Presentation by Anna Liberatore

★ Yangzhou, Jiangsu

Background

Why we are studying China's environmental issues

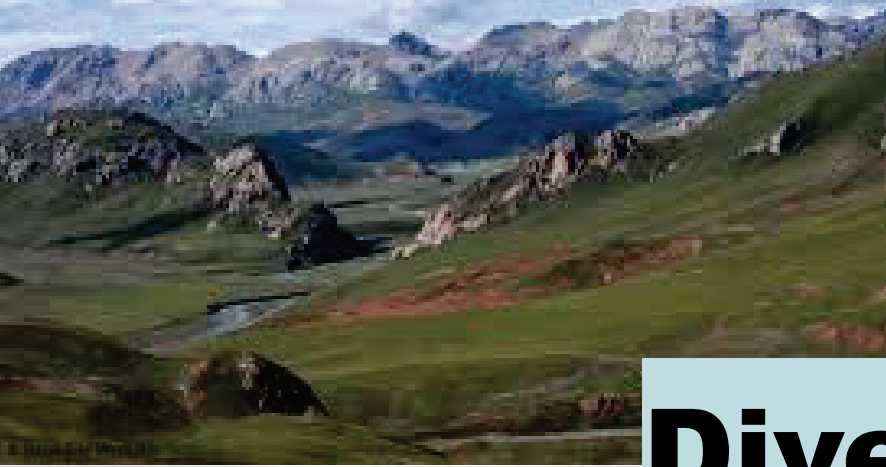
What makes China an important country to study when discussing global environmental impact today?

What makes China an important country to study when discussing global environmental impact today?

- Largest population of any country: **1.4 billion people**
- One of the largest countries (land mass)
- 3rd richest in plant diversity
- Internationally growing economy

Diverse geography

★ Qinghai-Tibetan Plateau



★ Gobi Desert



★ Yangtze River



Diverse geography

★ Narat Grasslands



★ Tianzi Mountain



★ Mingyong Glacier



What are some environmental problems that China faces?

What are some environmental problems that China faces?

- Air pollution
- Biodiversity loss
- Land degradation
 - Cropland degradation
 - Desertification
 - Wetland degradation
 - Grassland degradation
 - Deforestation
 - Soil erosion
 - Garbage
- Natural disasters caused by human impact
- Invasive species
- Water pollution
- Water shortage



Economic issues
Social issues
Public health issues

Population

- One-Child Policy – in place until 2015
- Population growth rate decreased to 1.3% in 2001
 - About **0.5% today** (The World Bank)
 - Problems: 1/3 of population over 65 by 2050 (Washington Post)

Population

- One-Child Policy – in place until 2015
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 - Problems: 1/3 of population under 65 by 2050 (Washington Post)

Will or should other countries enact a policy like this? Is controlling the number of children worse or better than dealing with the aftermath?

Population (cont'd)

- Less people...but more households
- Growing 3.5% per year 1990s – 2006

How could an increase in the number of households pose an issue?

China has a rapidly growing economy. What are some of their largest imports/exports and what environmental impact do you think these have?

Economy

- Largest producers and consumers in coal, fertilizer, steel, pesticides, electricity, chemical textiles, oil, cement, plastic
- Meat! Demand for meat increasing
- Transportation boom
- Inefficient technology – reliant on coal and inefficient with water usage

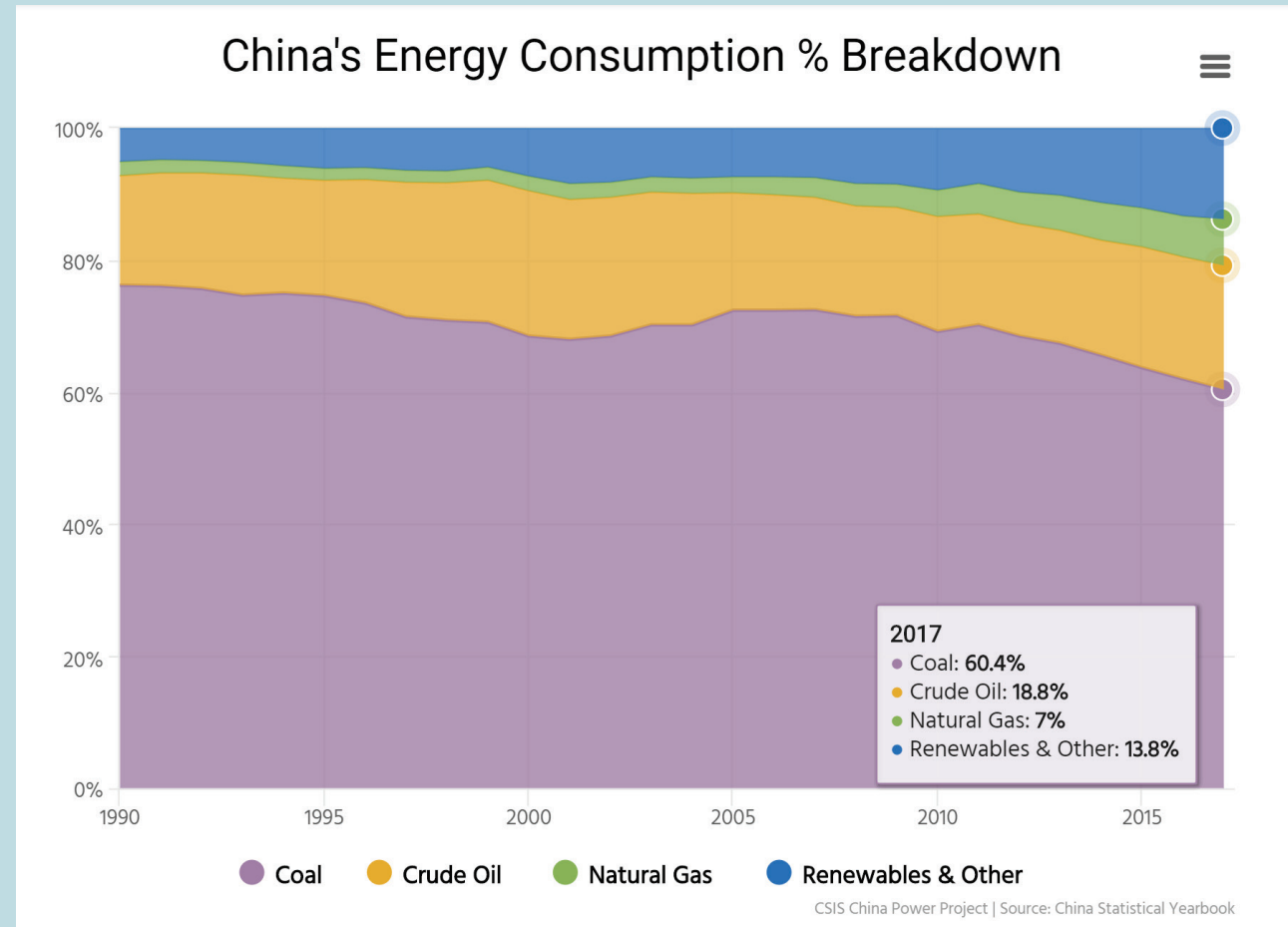
China's Environmental Problems

And in depth look at China's main environmental problems

According to Diamond, what are China's 6 main environmental problems?

Air

- Air pollution in cities
 - Coal!
- High PM (particulate matter) levels
- Acid rain – in ¼ of China's cities for ½ of rainy days



<https://chinapower.csis.org/energy-footprint/>

Water

- Industrial waste
 - Agriculture: fertilizers, pesticides, waste
 - Eutrophication
- **75%** of lakes and coasts polluted
- Untreated domestic water

★ Yangtze River Basin



<http://www.globaltimes.cn/content/1148899.shtml>

★ Dian Lake



<https://www.theguardian.com/environment/2018/aug/31/eutrophication-algae-how-animal-waste-is-turning-chinas-lakes-green>

Soil

- Massive erosion issues
- Loss of soil fertility
 - Fertilizers
 - Pesticides
 - Salinization (90% of land)
- Desertification (25% of land)
 - Overgrazing
 - Agriculture
- Less areas for cropland (50% decrease)



https://www.researchgate.net/figure/Loess-Plateau-and-the-Yellow-River_fig3_221912308

Of these three environmental issues, do you see central cause to these problems? How could this be fixed?

Of these three environmental issues, do you see central cause to these problems? How could this be fixed?

What other societies that we learned about had a similar central issue?

Habitat Destruction

- Deforestation – forests **16%** of land
 - Erosion
 - 1998 ban on logging
 - Droughts
- Destruction
 - Grasslands – 90% degraded
 - Wetlands – decreasing



<https://www.topchinatravel.com/china-attractions/sanjiang-plain-wetland.htm>

Biodiversity Loss

- Overfishing
- Invasive species
- Endangerment of native species



<https://www.worldwildlife.org/stories/giant-panda-no-longer-endangered>



<https://www.worldatlas.com/articles/chinese-alligator-facts-animals-of-asia.html>



<https://weeds.brisbane.qld.gov.au/weeds/alligator-weed>

Megaprojects

- Three Gorges Dam – Yangtze River
- South-to-North Water Diversion Project



<https://www.nytimes.com/2011/05/20/world/asia/20gorges.html?mtrref=www.google.com&gwh=738576E712DD5B37612A691C4FB7C5B9&gwt=pay&assetType=REGIWALL>

What impacts could these environmental problems have on a national scale and a global scale?

Large Impacts

- National
 - Economy – spending billions to fix environmental issues
 - Health – air pollution, floods, droughts → death rates
 - Natural disasters
- International
 - Trade
 - Atmosphere
 - Timber imports

What impact does international trade have on environmental issues in China?

What impact does international trade have on environmental issues in China?

Should First World countries be held accountable for consuming products made in factories that contribute to polluting China?

Compare the effects of globalization versus isolation on the range of a country's environmental issues (i.e., Rapa Nui v. China).

Do the pros outweigh the cons for living in a First World Country?

Positives and Negatives

- First World lifestyle = unsustainable
- Human resource use and environmental impact would DOUBLE if China became a first world country

Today

- Economic growth > environmental health

Diamond states that China's unified geography and government gives rulers a lot of control and the ability for drastic, quick change ... what do you think of this?

i.e., ending national logging, one child policy (negative – megaprojects)

What now?

- Diamond thinks China needs ...
 - Implement laws
 - Number of households will only increase
 - Meat/fish consumption increase

Is China capable of making drastic changes to solve some environmental problems? What changes would need to be made?

What did you learn about the issues that China faces today?

Coal Today

- April 2019 NPR article – China expanding coal-reliant power plants internationally
- Reducing use of coal nationally
 - Air quality improvements
 - Wind and solar energy



<https://www.npr.org/2019/04/29/716347646/why-is-china-placing-a-global-bet-on-coal>

Works Cited

- China Power Team, editor. "How Is China's Energy Footprint Changing?" *China Power*, Center for Strategic and International Studies, 15 Feb. 2016, chinapower.csis.org/energy-footprint/. Accessed 17 Sept. 2019.
- Diamond, Jared. *Collapse: How Societies Choose to Fail or Succeed*. Ed. with a new afterword. ed., New York, Penguin Books, 2011.
- "Environmental Impacts." *Three Gorges Dam Project*, 5 Dec. 2005, www.mtholyoke.edu/~lpohara/Pol%20116/enviro.html. Accessed 17 Sept. 2019.
- Fifield, Anna, editor. "Beijing's One-child Policy Is Gone. But Many Chinese Are Still Reluctant to Have More." *The Washington Post*, Washington Post, 4 May 2019, beta.washingtonpost.com/world/asia_pacific/beijings-one-child-policy-is-gone-but-many-chinese-are-still-reluctant-to-have-more/2019/05/02/c722e568-604f-11e9-bf24-db4b9fb62aa2_story.html. Accessed 17 Sept. 2019.
- Inskeep, Steve, and Ashley Westerman. "Why Is China Placing a Global Bet on Coal?" *NPR*, 29 Apr. 2019, www.npr.org/2019/04/29/716347646/why-is-china-placing-a-global-bet-on-coal. Accessed 17 Sept. 2019.
- Nunez, Christina. "What Is Acid Rain?" *National Geographic*, National Geographic Society, 28 Feb. 2019, www.nationalgeographic.com/environment/global-warming/acid-rain/. Accessed 17 Sept. 2019.
- "Population Growth (annual %)." *The World Bank*, World Bank Group, 2019, data.worldbank.org/indicator/SP.POP.GROW. Accessed 17 Sept. 2019.
- Shih, Gerry. "Beijing Air Improves Significantly in past Five Years, Study Finds." *The Washington Post*, Washington Post, 12 Sept. 2019, beta.washingtonpost.com/world/asia_pacific/beijing-air-improves-dramatically-in-last-five-years-study-finds/2019/09/12/1b64028e-d54d-11e9-ab26-e6dbebac45d3_story.html. Accessed 17 Sept. 2019.

HONR 229L: Climate Change: Science, Economics, and Governance

Final Word: China, The Lurching Giant

Ross Salawitch

17 September 2019

US Senate: A Long Story Short

At some point in time, the Kyoto Protocol had been signed and ratified by all nations except Afghanistan, Southern Sudan, Taiwan, and the United States.⁸ Canada withdrew from Kyoto in 2011, due to perceived pressure on the extraction of bitumen from Canadian tar sands. The US Congress failed to ratify the Protocol, which required Congressional Approval because it was viewed as a treaty by the US Government. In fact, on 25 July 1997 the Senate of the 105th Congress approved, by a vote of 95 to 0, a resolution⁹ that declared:

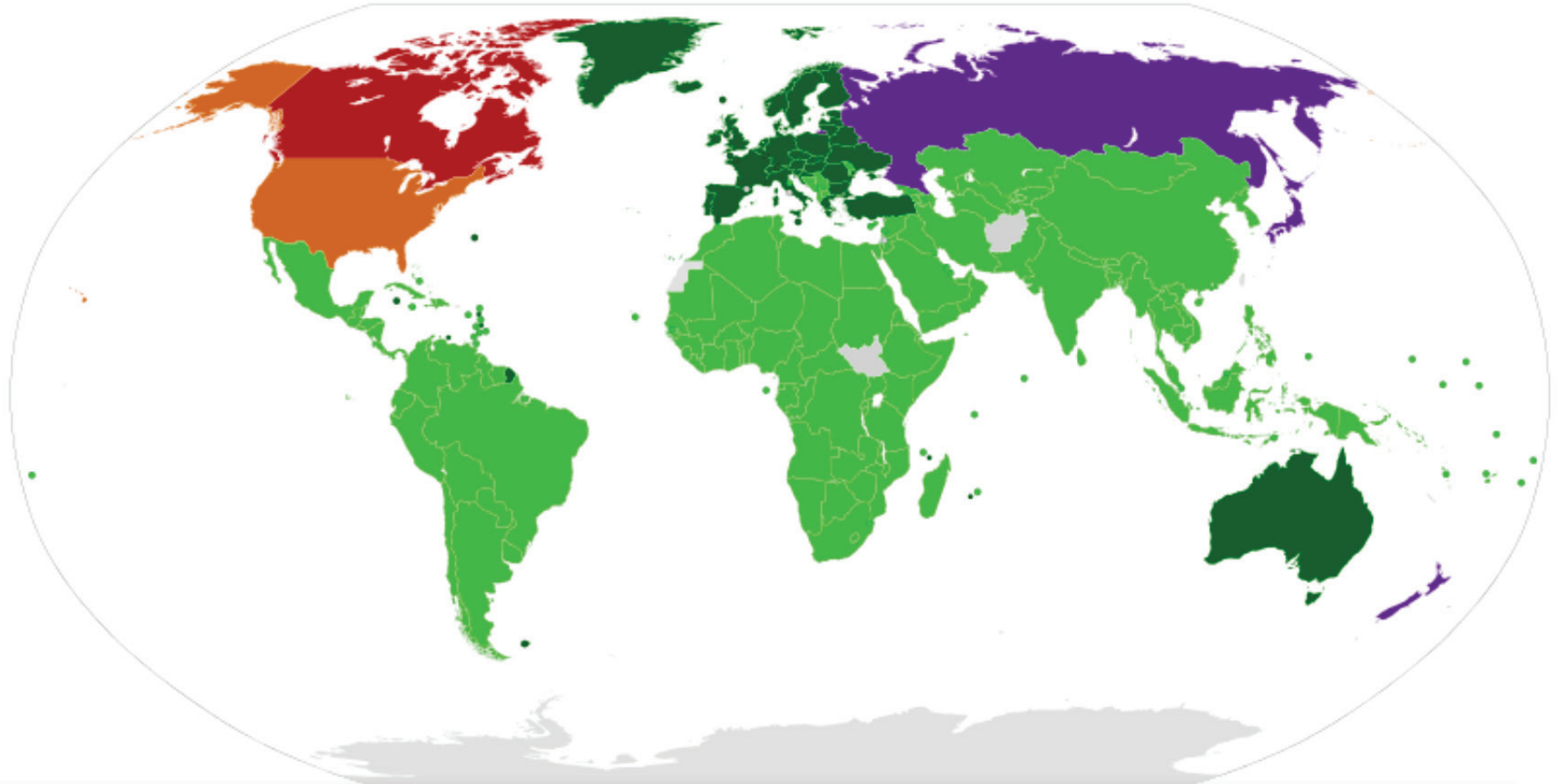
the United States should not be a signatory to any protocol to, or other agreement regarding, the United Nations Framework Convention on Climate Change of 1992, at negotiations in Kyoto in December 1997 or thereafter which would: (1) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex 1 Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period; or (2) result in serious harm to the US economy.

This resolution was passed *six months prior* to the Kyoto meeting. Since the Protocol did not include “specific scheduled commitments” to limit GHG reductions from developing countries, approval by the US Congress was always going to be an uphill battle (Victor 2001; Falkner et al. 2010).

⁹ <https://www.congress.gov/bill/105th-congress/senate-resolution/98>

Salawitch et al., *Paris Climate Agreement: Beacon of Hope*, 2017.

Kyoto Protocol



- Parties; Annex I & II countries with binding targets
- Parties; Developing countries without binding targets
- States not Party to the Protocol
- Signatory country with no intention to ratify the treaty, with no binding targets
- Countries that have denounced the Protocol, with no binding targets
- Parties with no binding targets in the second period, which previously had targets

<https://www.climate-change-guide.com/kyoto-protocol.html>

Paris Climate Agreement, Dec 2015:

Article 2, Section 1, Part a):

Objective to hold “increase in GMST to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels”

NDC: Nationally Determined Contributions to reduce GHG emissions

- Submitted prior to COP21-UNFCCC meeting in Paris
- Extend from present to year **2030**

GMST: Global Mean Surface Temperature

COP: Conference of the Parties

UNFCCC: United Nations Framework Convention on Climate Change

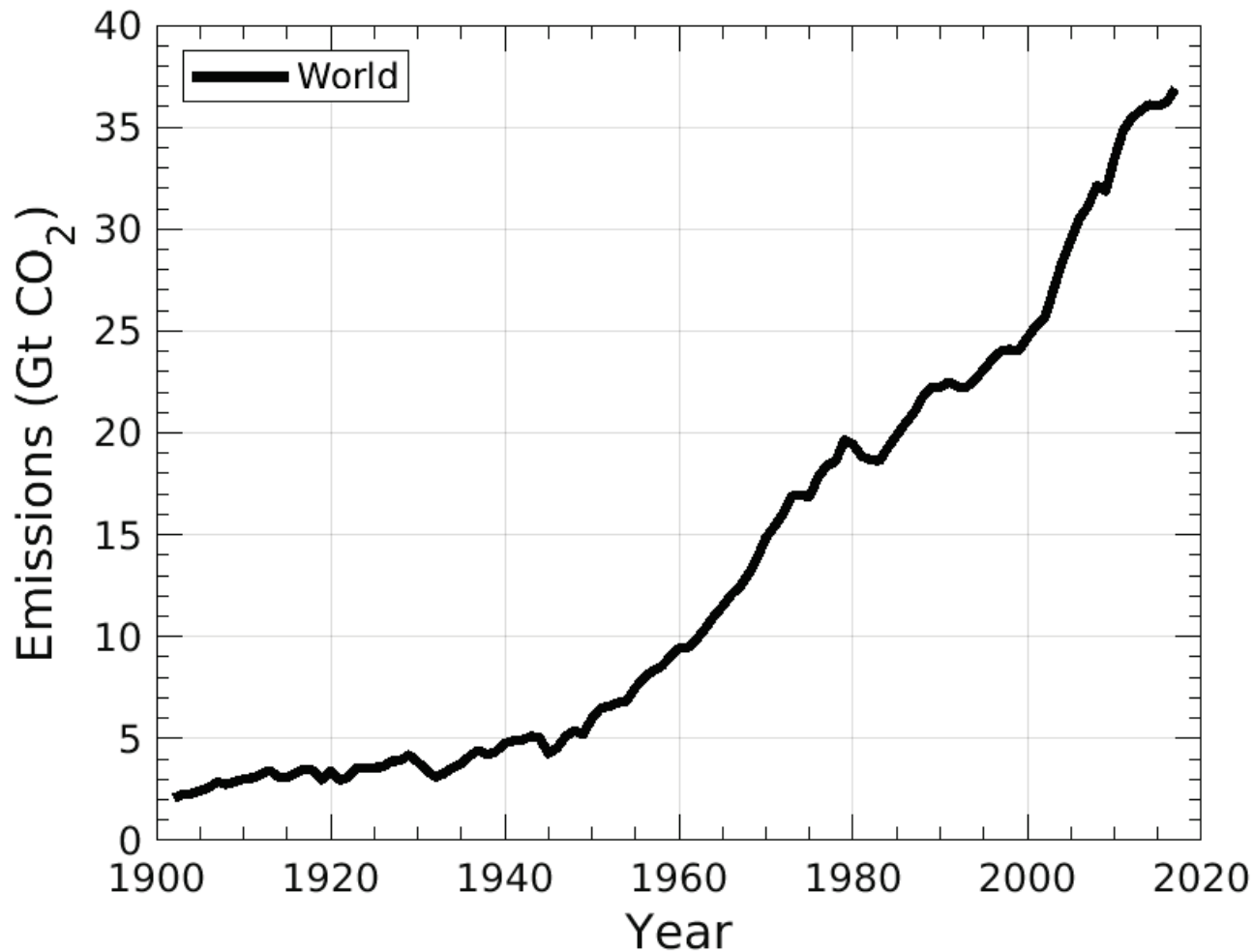
Nov 2014:

Presidents Obama & Xi announce:

U.S. will reduce GHG emissions to 27% below 2005 level by 2025
China will peak CO₂ emissions by 2030 with best effort to peak early



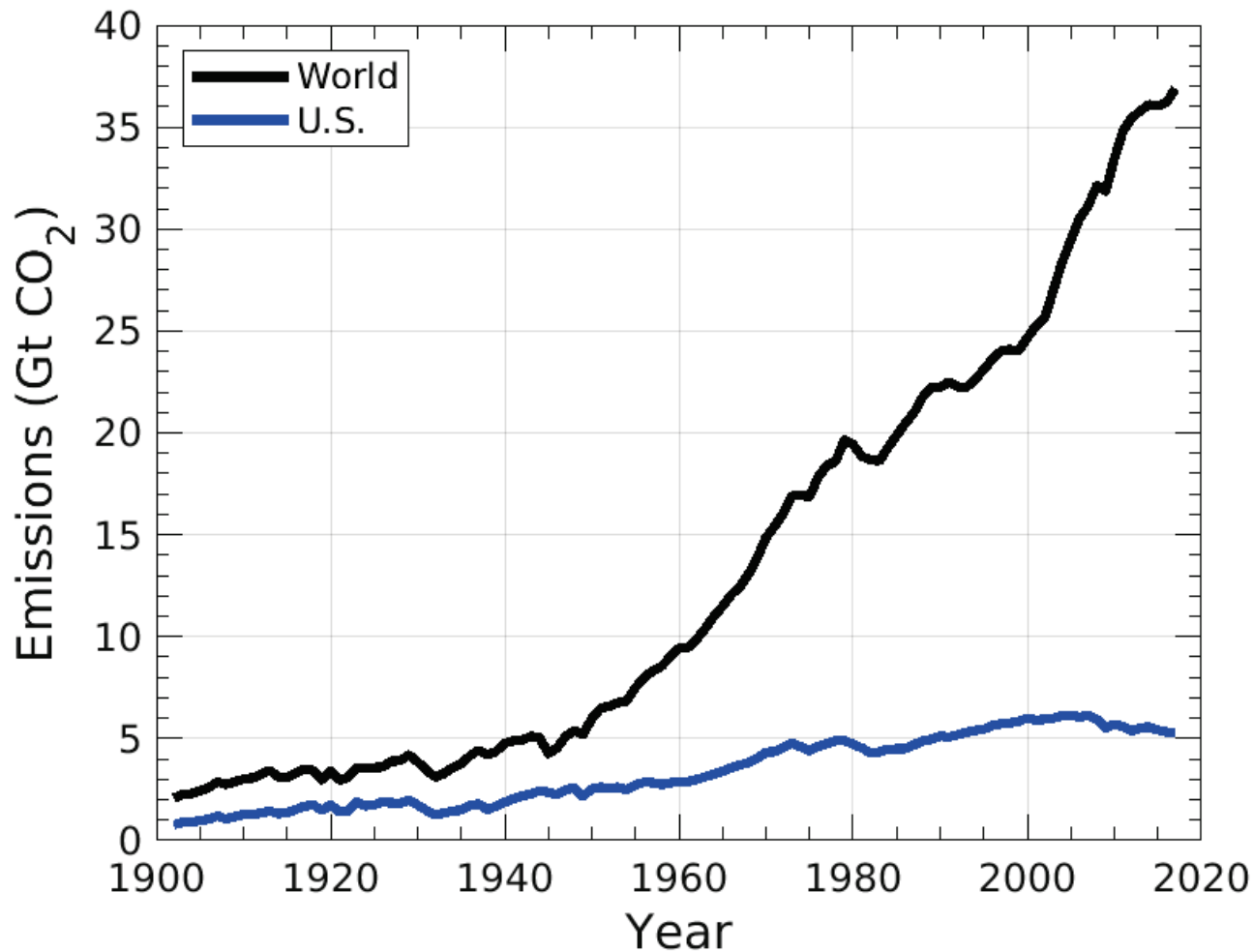
Carbon Emission, 1902 to 2017



Data Source: Global Carbon Budget 2017

https://data.icos-cp.eu/licence_accept?ids=%5B%22G6PjljYC6Ka_nummSJ5IO8SV%22%5D

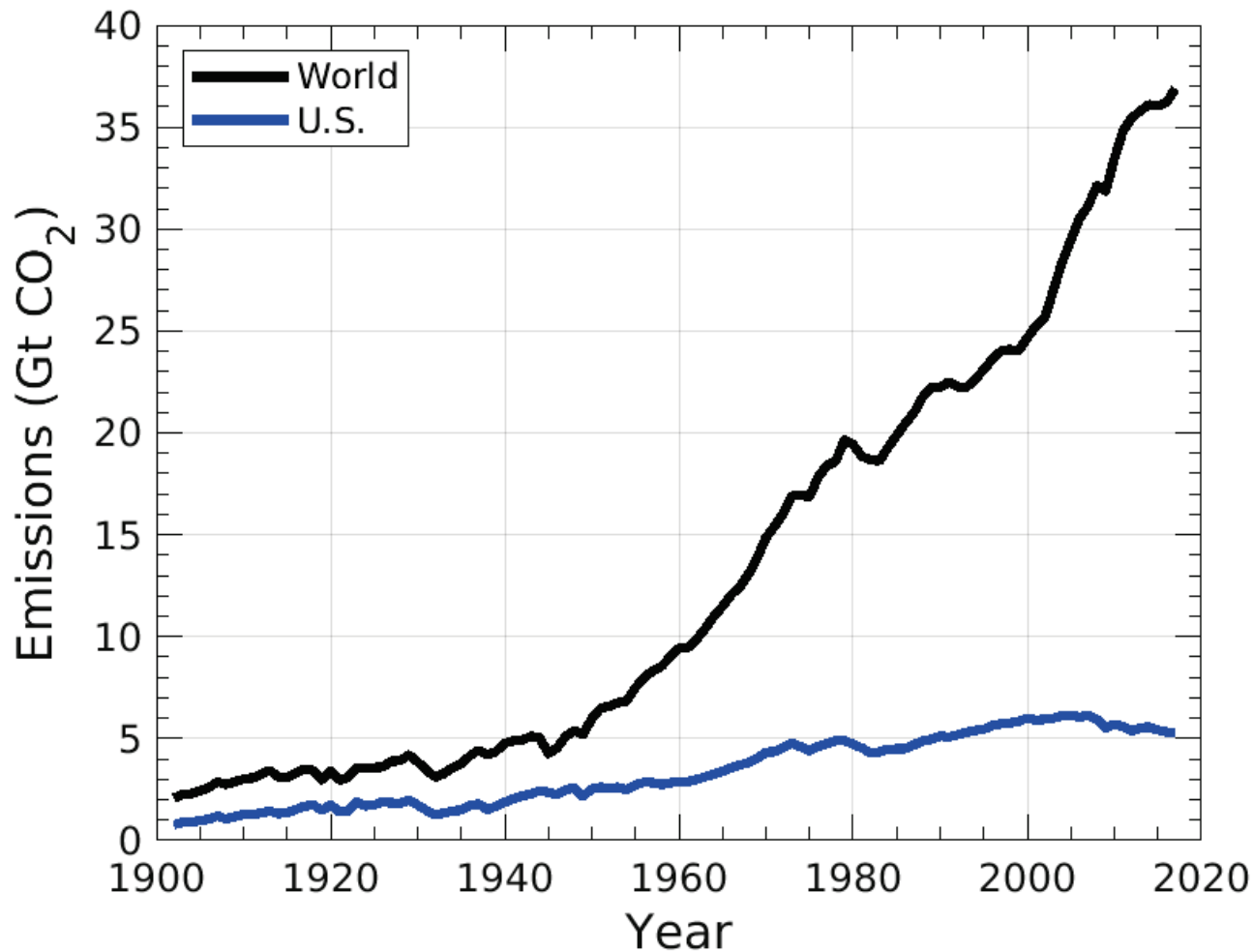
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When did Diamond state China would pass the U.S. ?

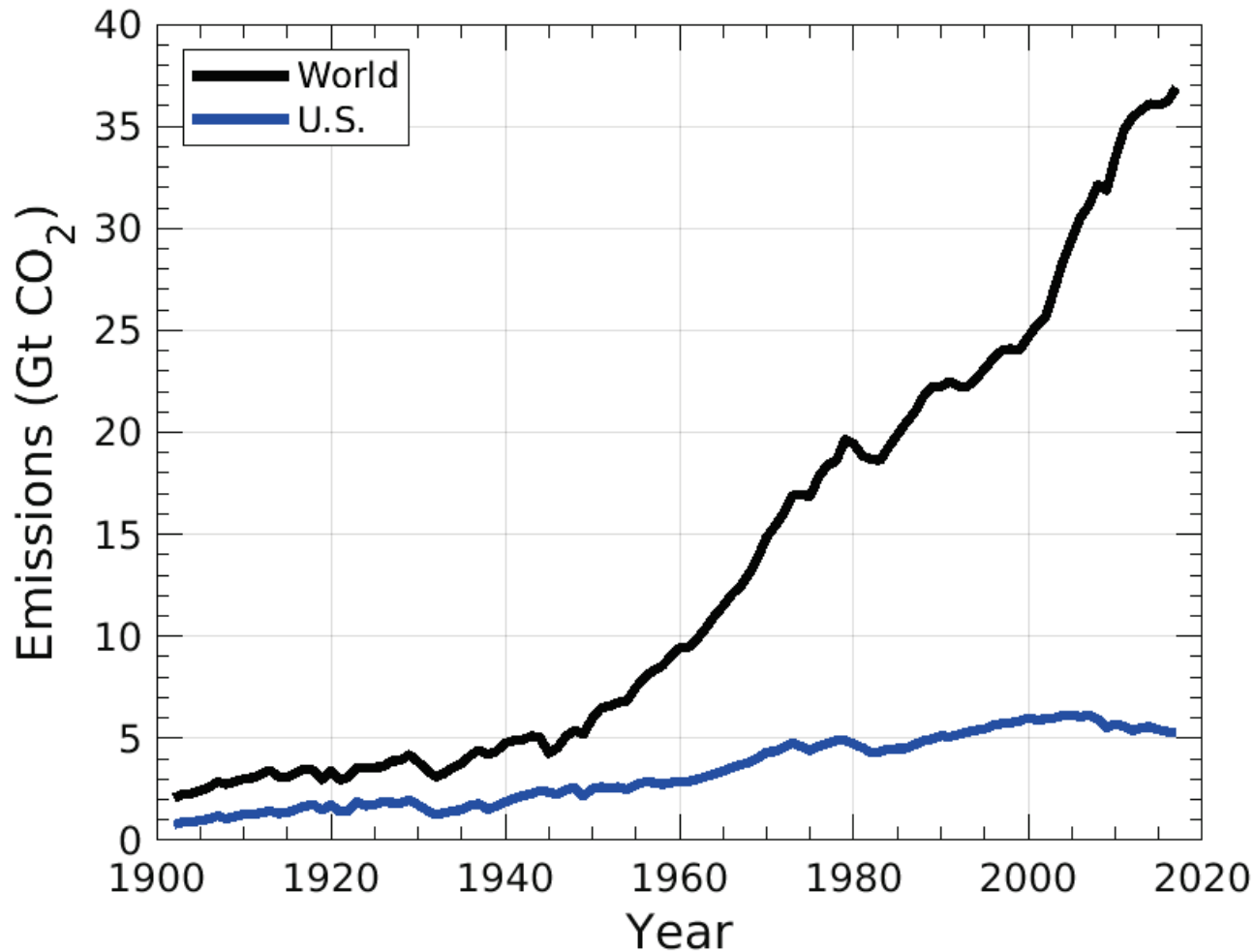


Data Source: Global Carbon Budget 2017

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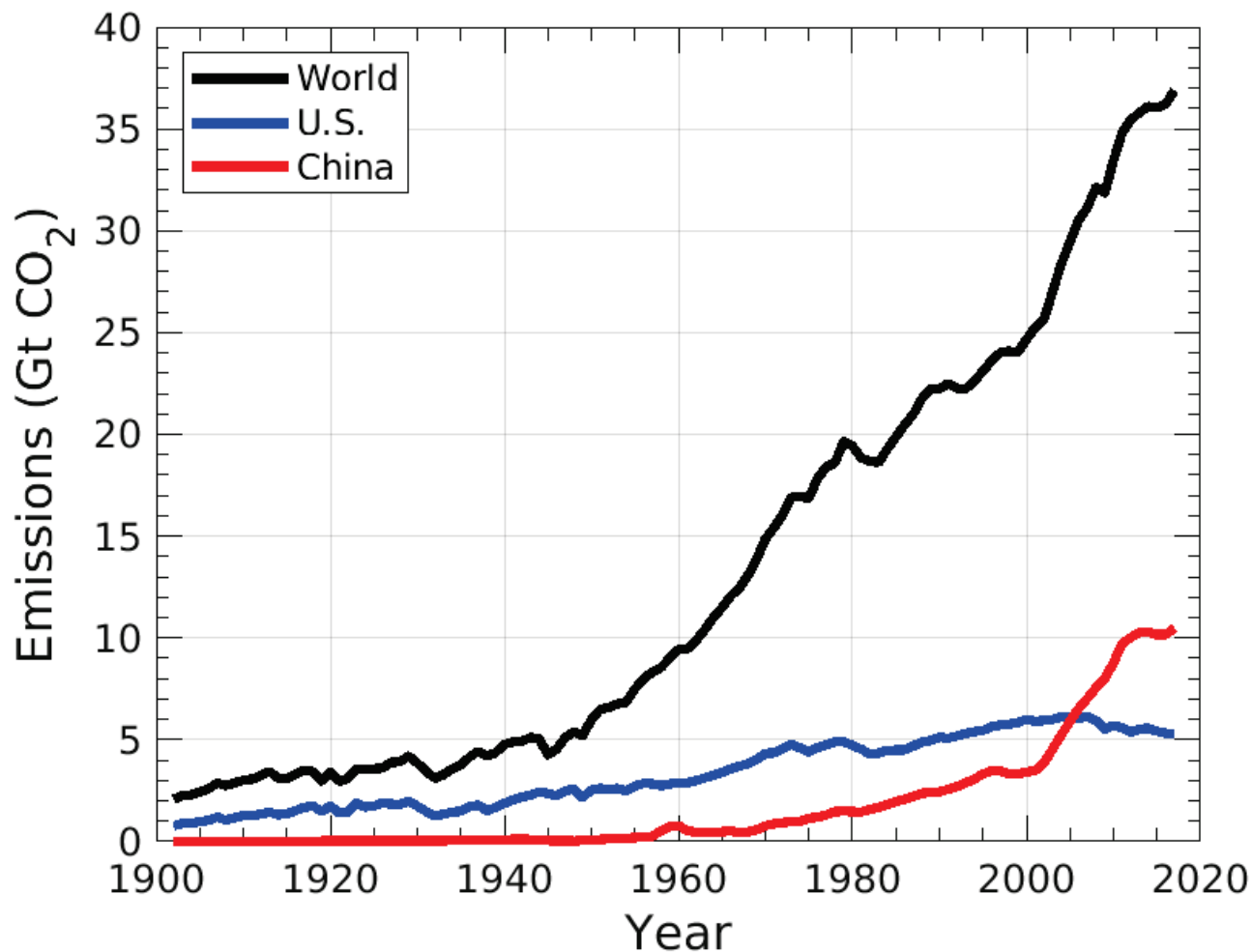
When do you think China either will, or did, pass the U.S. ?



Data Source: Global Carbon Budget 2017

https://data.icos-cp.eu/licence_accept?ids=%5B%22G6PjIjYC6Ka_nummSJ5IO8SV%22%5D

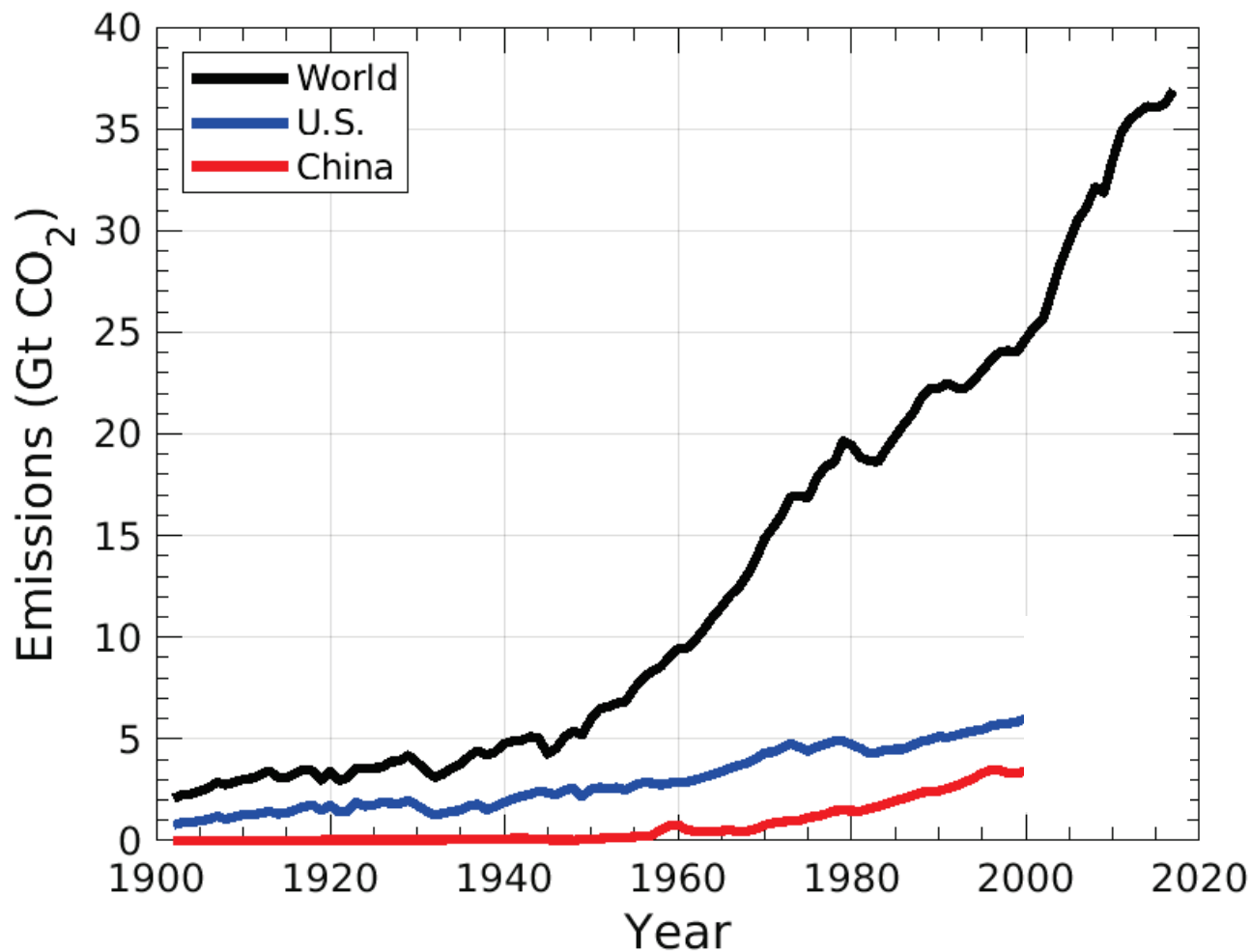
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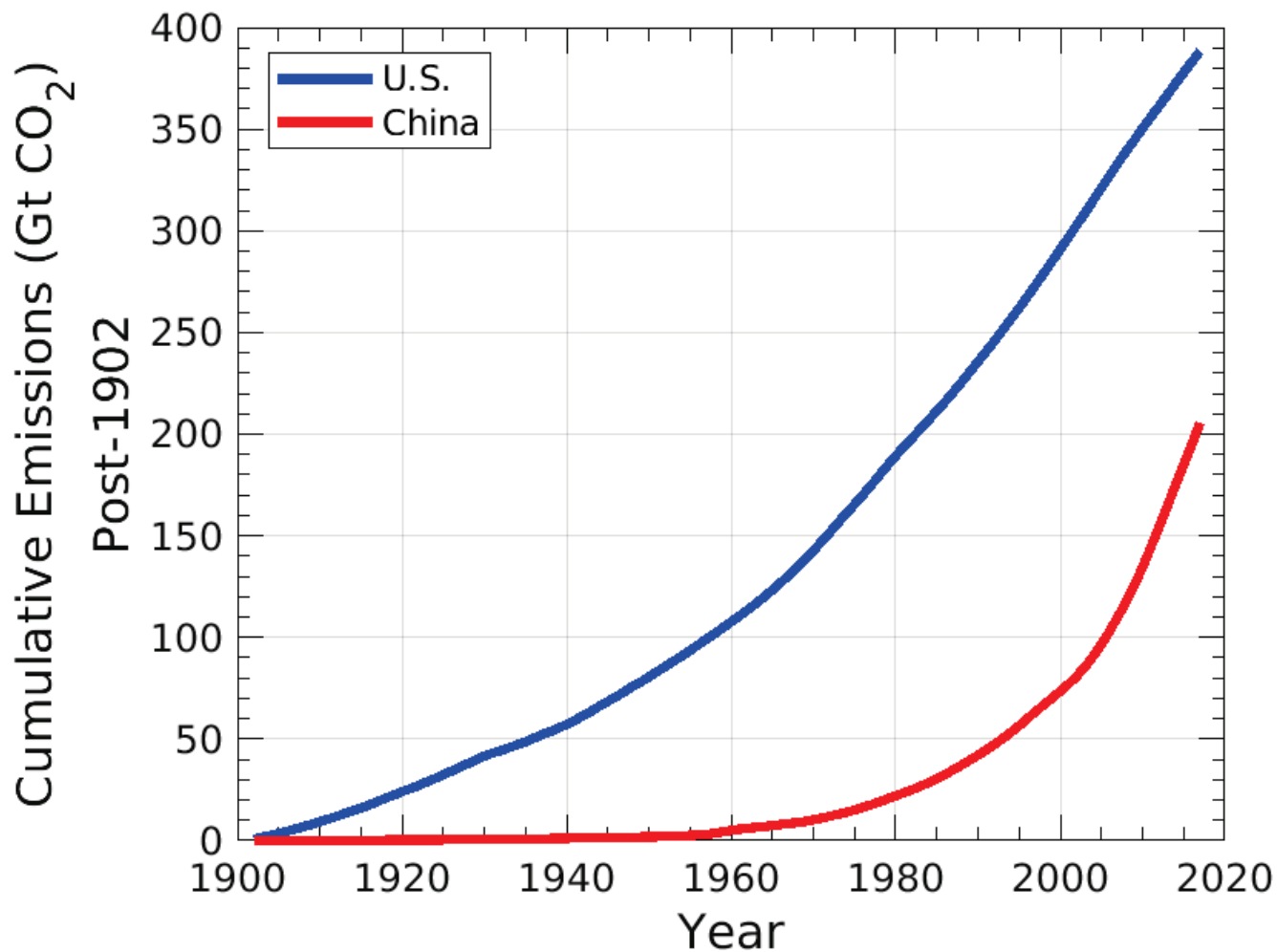
Carbon Emission, 1902 to 2017



Data Source: Global Carbon Budget 2017

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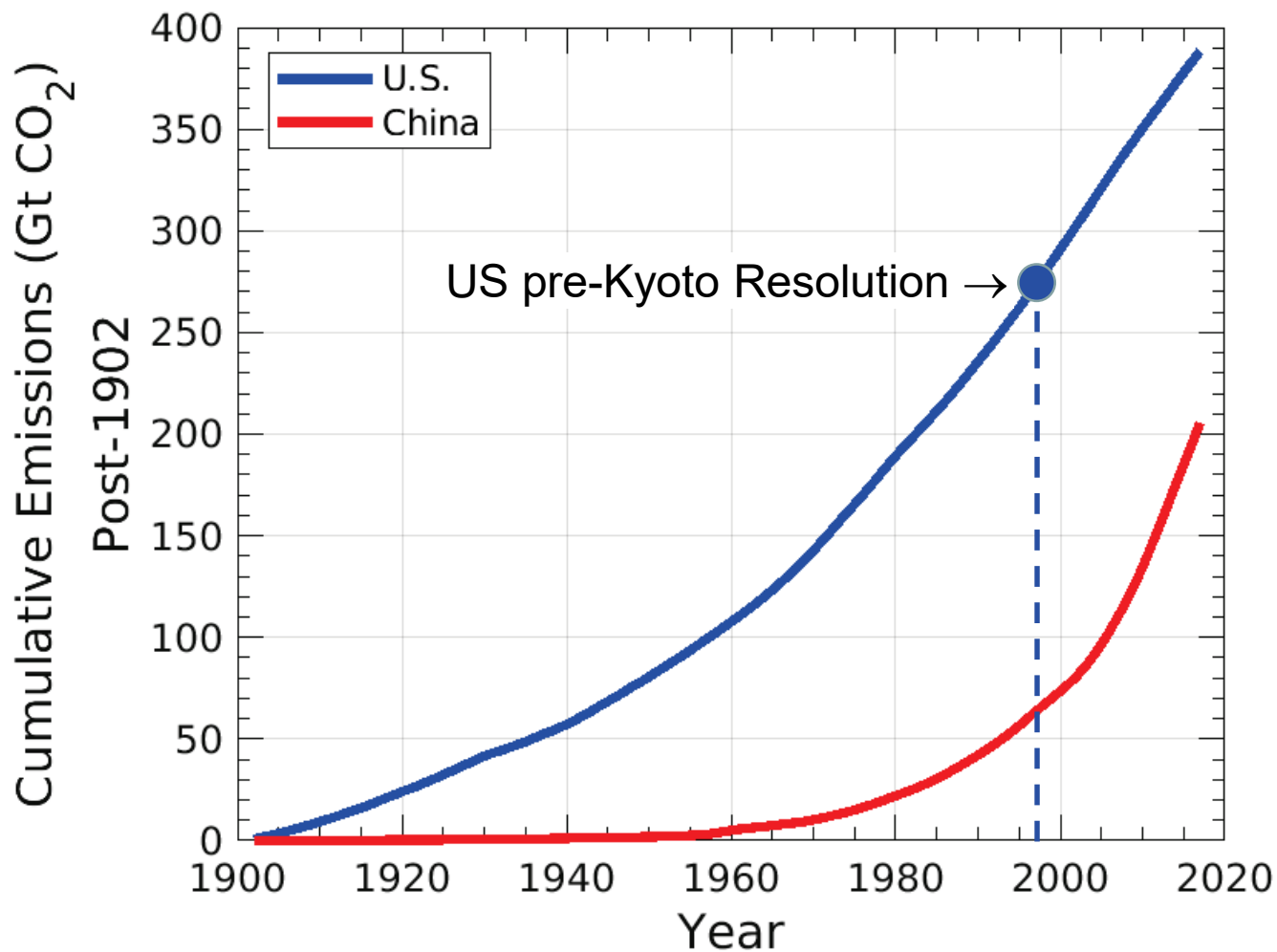
Cumulative Carbon Emission, U.S. & China, 1902 to 2017



Data Source: Global Carbon Budget 2017

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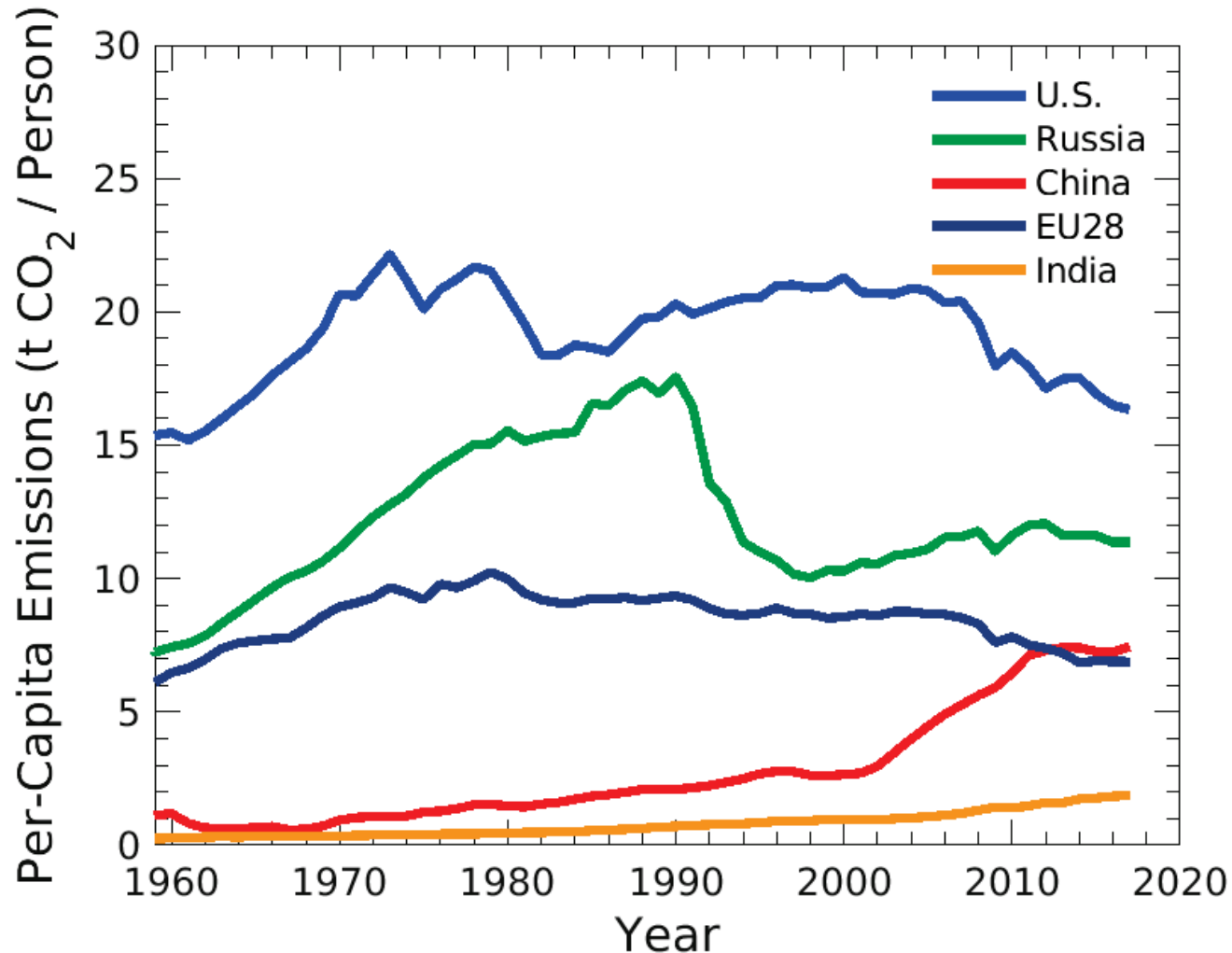
Cumulative Carbon Emission, U.S. & China, 1902 to 2017



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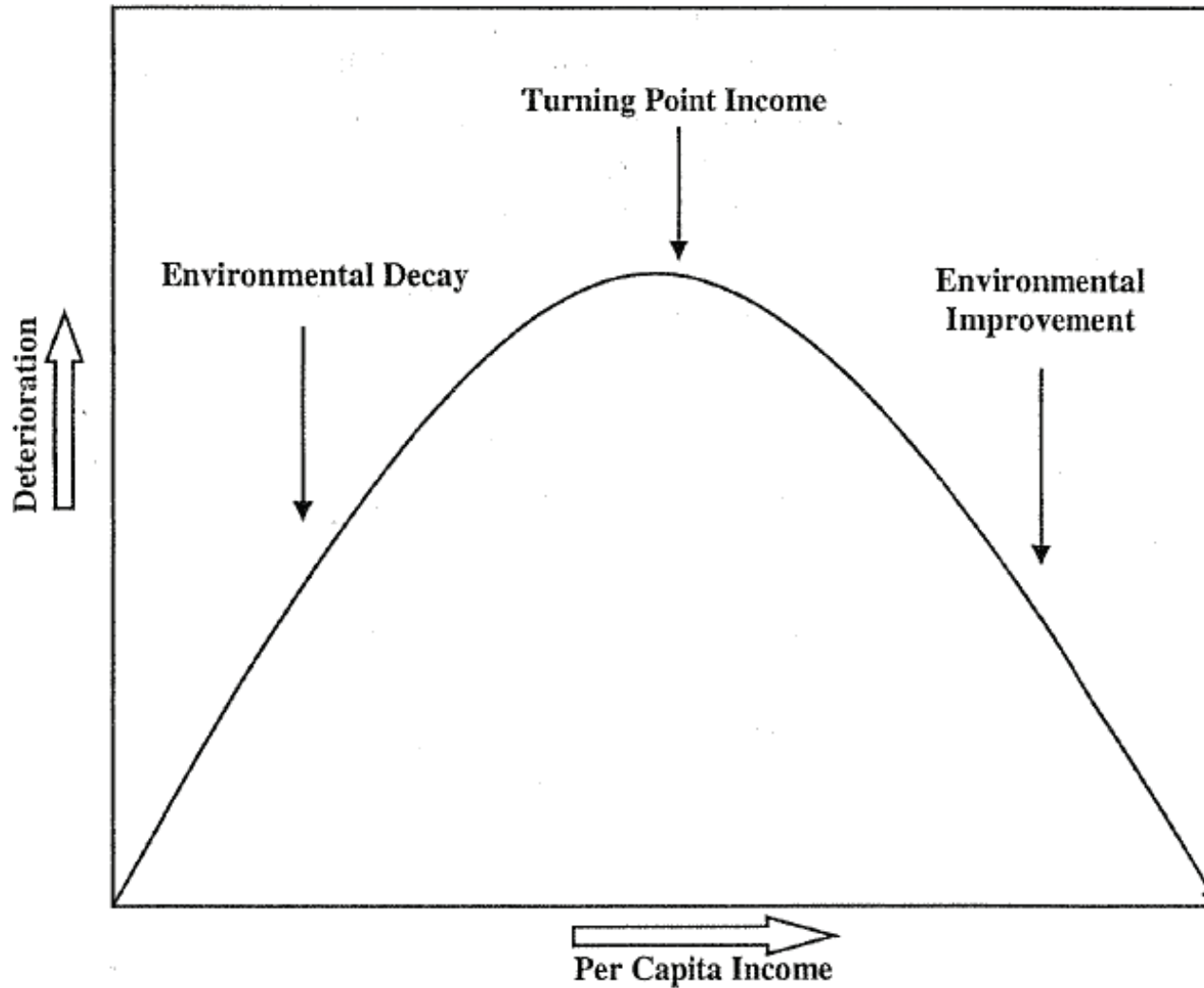
Per Capita Carbon Emission, Big Four & the EU, 1959 to present



Data Source: Global Carbon Budget 2017

https://data.icos-cp.eu/licence_accept?ids=%5B%22G6PjIjYC6Ka_nummSJ5IO8SV%22%5D

Kuznets Curve



https://www.perc.org/sites/default/files/Yandle_Kuznets02.pdf

https://en.wikipedia.org/wiki/Kuznets_curve

China is surprisingly carbon-efficient —but still the world’s biggest emitter

China emits far less greenhouse gas per person than Western countries did at the same stage of economic development

■ □ Print edition | Graphic detail > May 25th 2019

With its four-tiered smog warnings and lethal dumps of toxic waste, China has become Exhibit A for the environmental costs of economic development. Its growing meat consumption and reliance on fossil fuels have also made it a focus for people worried about climate change.

In one sense, China’s reputation as the bellows of “hothouse Earth” is overblown. Since 1850 countries with a GDP of \$12,000 to 16,000 in 2019 dollars have produced a population-weighted average of 10.6 tonnes of CO₂-equivalent gases per person per year. In 2016 China’s GDP was \$14,000, and it emitted just 9.3 tonnes per person.

Moreover, China pollutes far less per person than Western countries did at the same stage of development. When America, France, Britain and Germany had incomes similar to modern China’s, they relied on inefficient power stations and cars, and spewed out 16.6 tonnes per person.

The combination of China’s huge population and rapid GDP growth has nonetheless made it the world’s biggest emitter of carbon.

<https://www.economist.com/graphic-detail/2019/05/25/china-is-surprisingly-carbon-efficient-but-still-the-worlds-biggest-emitter>

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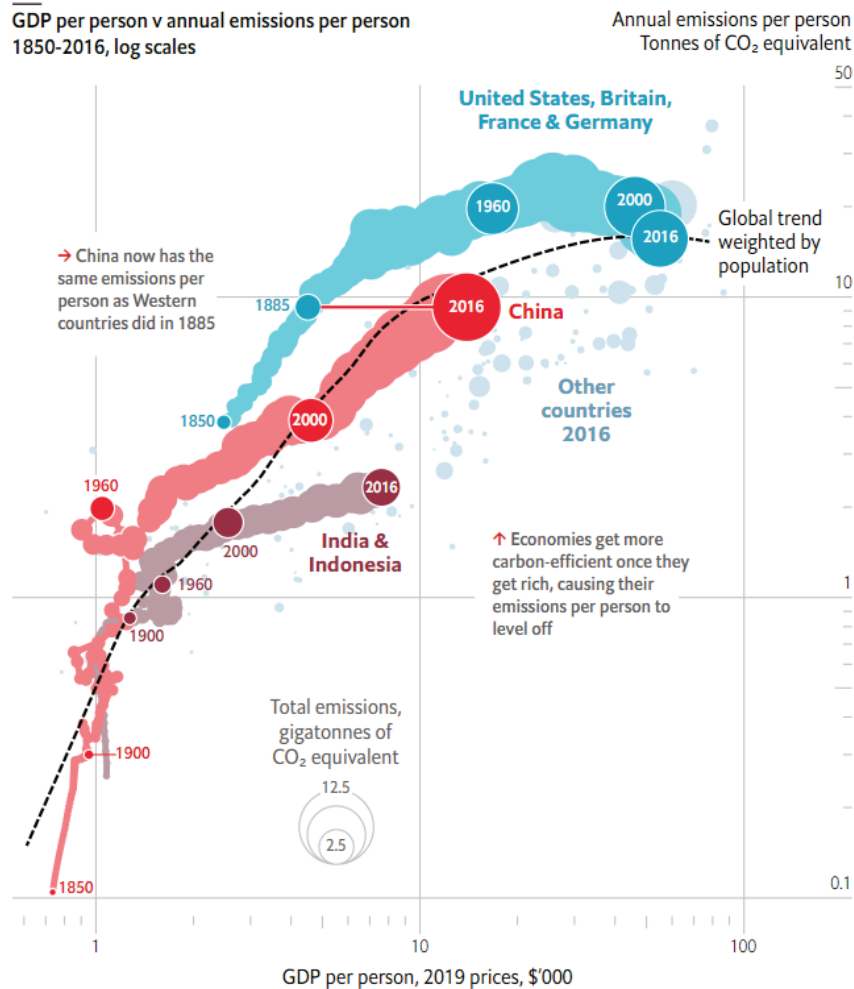
■ Print edition | Graphic detail > May 25th 2019

To prevent the stock of greenhouse gases in the atmosphere from reaching levels likely to cause disastrous warming, China must do better than merely beating the past records of richer countries. Instead, it will need an unprecedented decline in emissions per person—at least to the more carbon-efficient level of similarly rich Latin American economies, and ideally onto the trajectory of poorer Asian giants like **India** and **Indonesia**, which rely less on heavy industry and manufacturing. Those countries, perched at the sweltering latitudes where farmers will be most hurt by climate change, **must in turn work out how to reach upper-middle-income status without replicating China’s emissions path.**

To their credit, Chinese authorities, spurred by public concern about air pollution, have prioritized green policies, such as switching from coal-fired power stations to renewable sources and setting up an emissions-trading system. China’s annual rate of emissions growth has fallen from 9.3% in 2002 to 2011 to 0.6% in 2012 to 2016. The waning of its cement-intensive construction boom should slow emissions further. But it will take more than incremental gains to stave off severe warming.

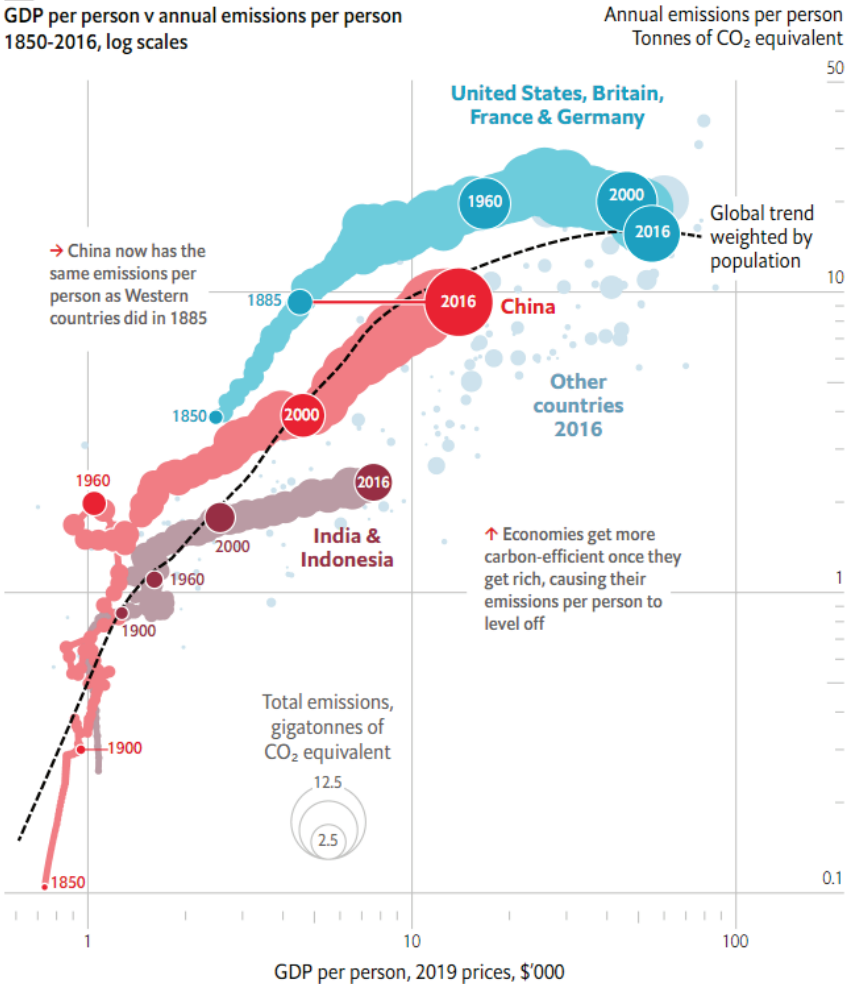
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Finally, great if I can see Eric and Anne after class, to discuss presentations for next week.