LITERATURE REVIEW

Those in favor of the idea that China's domestic climate efforts legitimize its leadership goals generally present two core arguments: 1) China is the global leader in renewable energy and 2) China is the global leader in climate agreements. Falkner cites China's 2014 investment of 83.3 billion USD in renewable energy as particularly significant, given that it was the largest ever investment in alternative energy in a single year.[1] In addition, China has ramped up solar-cell production from 50 megawatts to 23,000 in less than ten years.[2] Li forwards a similar argument by citing specific programs the central government has formulated: The China Renewable Energy Development Program and China Renewable Energy Scale-up Program have both been tremendous successes and have put Chinese-manufactured renewables on the cutting-edge of global energy development.[3] These investments and programs are particularly important for determining China's leadership capacity because they have focused on promoting export capacity, which can be an effective way to disseminate technology and influence other countries.

Proponents also defend China's domestic efforts based on China's willingness to establish linkages with other actors. Falkner argues that the bilateral agreement negotiated in 2014 between the United States and China represents the single most important climate deal ever. Not only did the deal bring the issue of climate change to the forefront of each country's respective political discourse, but it also proved critical in paving the way for the success of the Paris agreement that would follow a year later.[4] Moreover, China's goal of leading the world in climate action is tied to its foreign policy priority of avoiding international ridicule.[5] Li argues that one of the major motivations for China in developing a domestic emissions-trading scheme is to eventually be able to link it with the European Union's cap-and-trade system and lead the developing-nations wing of emissions trading.[6] While arguments that posit China's domestic efforts as a strong foundation for international leadership tend to focus on overarching goals and general trends, arguments against this position tend to instead highlight the specific details of emissions and policy.

Aldy and Pizer argue that China cannot be a top climate leader until its emissions are under control. They cite that total Chinese emissions have grown 250% since 1997, the intensity of Chinese emissions is five times that of the United States, and that Chinese coal consumption continues to grow rapidly while US and EU rates are falling.[7] The study referred to uses absolute emissions totals and chooses not to account for population growth. Although the energy intensity of growth accounts for rising incomes, the significance of the combined influence of income, population, and technology will be explored later in this paper.

In addition to the statistically driven critique of China's potential international leadership role, Godement reasons that China is not fit to lead the international community because of its opposition to binding international agreements.[8] Although China has played a proactive role in negotiating climate agreements, the 2008 global financial crisis exposed potential weaknesses in the Chinese economy,

prompting CCP leaders to be more cautious regarding measures that could threaten growth. Hence, Godement argues that China has pushed its domestic growth agenda ahead of and onto its foreign climate agenda, making it less ambitious and more flexible, as mirrored in agreements like COP21.[9] The precise nature of international agreements is an important arena to explore because these deals operate as the nexus at which foreign policy negotiation and domestic policy implementation either reinforce or weaken one another.

Analysis

This section will focus on the claim that China's domestic climate policy does legitimize its international leadership efforts, but there is one implicit assumption that must be thought through first: Can domestic efforts legitimize international leadership efforts in the first place? The answer to this question is also yes.

There are several reasons why domestic efforts are critical to international ones, so each will be discussed only briefly. First, Chinese decision makers and the Chinese public must be convinced that particular solutions work before they are willing to risk their political livelihoods and international image on those fixes.[10] The domestic arena acts as a laboratory and training ground for such solutions. Second, Chinese leaders have tried to frame its leadership ascendance around its intention to be a "responsible great power."[11] The climate has become the ultimate area of 'responsibility' on the international stage and as a result, China's climate action has become a litmus test of this promise.

Striving to be a responsible great power is a component of a larger foreign policy goal: to avoid international ridicule.[12] China has been roundly criticized by many Western powers for not doing enough to curb its emissions and this has generated a fear among Chinese leaders that a negative perception of the Chinese government may 'spill back' to influence Chinese public opinion.[13] Using climate action as an opportunity to demonstrate that China is a responsible power committed to a rules-based order would go a long way towards silencing critics and promoting Chinese leadership.[14]

In order to complete this argument, it is necessary to consider whether the relationship between Chinese domestic and international climate efforts is reverse causal. In this scenario, reverse causality would mean that an absence of domestic policy would make international leadership impossible and that the presence of robust domestic climate action would be sufficient to legitimize Chinese leadership. It is almost undoubtedly true that if China were to take no domestic action, it could not lead parallel international efforts. However, the question this paper will investigate is the threshold for that action. Godement argues that one of the critical factors holding back Chinese climate leadership is the internationally perceived lack of domestic follow through.[15] By this argument and those above, it seems that domestic efforts are a necessary prerequisite to international leadership. However, it is difficult to make the case that domestic efforts—on their own—are a sufficient condition for

international leadership. There are an infinite number of variables that factor into whether a particular country follows another on a particular issue, but in the case of China, many of those alternative factors—leadership void, growing global interdependence, et cetera—are also trending in favor of climate leadership. With these conditions, it appears that domestic policy can act as a sufficient foundation for global leadership.[16]

Having provided a basis for the assumption that domestic climate policy has a bearing on global leadership initiatives, there are two subdivisions that can be made regarding the influence of domestic policy: practical and perceived. Practical considerations regarding domestic climate policy include calculations such as whether emissions are increasing or decreasing, the energy intensity of growth, and so on. The perceived impact of domestic efforts deals with whether countries believe China is a climate leader, regardless of the effectiveness of their action.

It is undeniable that Chinese emissions are the largest single source of greenhouse gases and are continuing to increase. Yet, precisely how the issue is framed can make China seem more or less culpable. As explained in the arguments section, Aldy and Pizer focus on cumulative emissions. From this perspective, it is difficult to deny that Chinese emissions are only climbing higher and are to blame for a massive portion of global greenhouse gases (Figure 1). However, when analyzing per-capita GHG trends in Figure 2, it is a different story. From this alternative view, Chinese emissions are increasing, but remain only a fraction of American and Russian emissions while being roughly equivalent to those of the EU. Moreover, it is important to consider factors that impact emissions such as affluence and population. I = PAT (environmental impact = population x affluence x technology) is relatively well accepted in both environmental science and policy-making circles because it accurately describes complex environmental problems while collapsing that complexity into just a few digestible variables.[17] Although there are criticisms of this model for its lack of specificity in the context of specific environmental issues, it is useful for describing broad trends over time.

With I = PAT in mind, not only do per capita emissions become more relevant, but population growth and affluence trends do as well. Total population growth rates (Figure 3) are somewhat sporadic for particular countries, but in the case of China, there is a smooth downward trend. This should make it easier for China to get a handle on its pollution because energy expansion can be met by renewable sources that may take longer to fund and construct rather than by coal plants that spring up to meet rapidly increasing demand. Considering aggregate population trends in tandem with urbanization rates is key to effectively scrutinize emissions because higher levels of urbanization generally produce lower emissions.[18] This reduction is likely to be amplified in China as the central government increasingly pushes localities to plan megacities in a low-carbon, sustainable fashion.[19] Figure 4 shows that while many industrialized countries and even developing nations like India are slowly becoming more urban, China's urban population is growing at

a monumental pace. This rural to urban migration inevitably strains resources and puts stress on municipal infrastructure, such as energy utilities, to provide for the rapidly growing population. As such, emissions may increase in the interim, but it is a boon for climate action down the road. Figure 4 suggests that most developed countries do eventually stabilize at a particular level of urbanization and this is likely to occur in China as well. Once the transition is over and city planners can rework some basic systems, there is likely to be a drastic reduction in emissions.

The flip-side of the population coin is affluence. In one scenario, there can be many people who do not earn much money and emissions are likely to remain low, as was the case in China some time ago and in India more recently. Or, in another, there can be a smaller group that earns much more and emits according to their ability to consume, as in the case of the United States. Figure 5 indicates that although Chinese GDP has grown at unprecedented rates over the last two decades, the average Chinese income is still much lower than the American or European income. This state of affairs represents a threat to climate action and a potential argument to project ballooning Chinese emissions: There is still a high ceiling on wealth and, in turn, emissions. However, Figure 6 should allay some of that concern. Energy intensity is a measure of how much energy is required to produce a given unit of growth. Figure 6 shows that while Chinese growth remains relatively energy-intensive, it is a dramatic decline from just two decades ago and the trend continues to point downward. This is another flaw in Aldy and Pizer's analysis: they simply consider Chinese growth intensity relative to the US, but fail to account for how high that intensity has been in the past and how low it could fall in the future. Less energy-intensive growth can mitigate the impact of an increasingly wealthy population by decoupling that wealth from emissions. The trend towards fewer emissions per dollar of purchasing power has yet to level off and is likely to continue as China develops a more robust renewables capacity, the "T" in I = PAT.

Perhaps the most promising trend in Chinese domestic policy is the increasing growth of renewable energy. In absolute terms, China has the largest capacity of solar and wind projects of any country in the world.[20] Figure 7 illustrates that as many actors stagnate in their adoption of renewables, China continues to lead the way—nearly keeping pace with the EU. Although China's prospects as a climate leader appear promising from an examination of Figure 7, Figure 8 presents the opposite outcome. Figure 8 reveals the clearest difference between actors of any graph presented: China's coal consumption remains sky-high. Despite its best efforts and burgeoning renewables sector, China cannot seem to kick coal for good. Although this curve has begun to level off and even dip, it is unlikely that China's coal consumption will sink to levels comparable with the other countries considered any time soon. The question of whether these levels of coal consumption restrain China's ability to become a climate leader then arises. Although it will invariably be criticized, China's coal consumption is not sufficiently limiting to prevent the country's rise to global climate leadership.

One of the factors mediating international perception of China's thirst for coal is the difference in exports between Chinese coal and alternative energy. Brazil has produced 90%+ of its electricity from renewable sources for over twenty years, but Brazil has not led a global effort to adopt low-carbon energy because its model of hydroelectric power is not universally replicable and Brazilian industry has struggled to export their innovations.[21] For this same reason, China's renewable development is comparatively more influential than is its coal consumption: While China is the leading exporter in renewable energy, it is a net importer of coal.[22] This dynamic begs the question of perception. If China were a poor marketer, there is certainly enough evidence to make the case that Chinese climate leadership would represent hypocrisy, but if China is able to control the spin, then its alternative energy development can be emphasized.

The statistical discussion above should give the impression that although China can put forth a compelling case to underpin its rise as a climate leader, it is not without holes. This fact renders perception especially important. Despite having the highest levels of coal consumption in the world by far, China also has the highest level of renewables investment,[23] the highest levels of renewables exports,[24] and the highest level of solar and wind manufacturing and installations.[25] China's leadership in these areas has been produced by a commitment to international agreements and domestic policy that promote the growth of renewables such as COP21, CREDP, CRESP, and the Chinese ETS.[26] This policy suite of technological advancement, international agreements, and market-based approaches has given China at least the image of being one of the most innovative climate leaders.[27]

These policies and agreements were discussed earlier, but it is essential to consider them again in the context of international perception. Although Godement and others forward legitimate critiques of the logistics of implementation and enforcement of these programs, those are only likely to stick in a world of a better alternative. In other words, if binding agreements were the norm, it is far more likely that China's resistance to such restrictions would damage Chinese leadership credibility. But that is not the plane on which status quo climate politics operate. Instead, countries with concern for climate change are looking for what Hallding et al. refer to as "two minimals."[28] The purpose of China's domestic climate effort is not to build the world a silver bullet, but to demonstrate that the most coal-intensive, fastest-growing developing economy in the world can take positive climate action too. By demonstrating some level of commitment to climate action through domestic policy, other states can be provided the "assurance that China is sufficiently 'in' for there to be a realistic chance of containing global emissions."[29] In so doing, China can act as the global leader by building trust and bridging the gap between developing and developed economies to begin to resolve the ultimate first mover problem that is climate change.

Conclusion

Combatting global climate change is a collective action problem that will require global coordination and leadership. China is well positioned to take on the global green mantle by both objective and perceived metrics. It is more likely than not that Chinese emissions will begin to level off and decline in the future as urban populations grow and growth intensity continues to fall. However, this does not mean that Chinese domestic climate policy is a clear success. There are still many measures by which China lags behind the rest of the world, namely, the paradox between its simultaneously increasing coal and renewables consumption. Yet, precisely because of China's importance and complexity, foreign actors are likely to look to China as the global climate leader based on the country's commitment to climate policy domestically, despite imperfections. Future research ought to track the United States' international climate influence as the Trump administration's agenda takes shape, and should pay special attention to China's actions at the 2017 Boston climate summit. Moreover, the trends observed in the figures of this paper should continue to be tracked given that the basic factors of population, affluence, and technology are likely to remain considerably influential in determining emissions levels.

Notes

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18. Creutzig, Felix, Giovanni Baiocchi, and Robert Bierkandt, "Global Typology of Urban Energy Use and Potentials for an Urbanization Mitigation Wedge," PNAS 112.20 (2013): 6283.
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Appendix

Figure 1 (Source: World Resources Institute CAIT Tool)

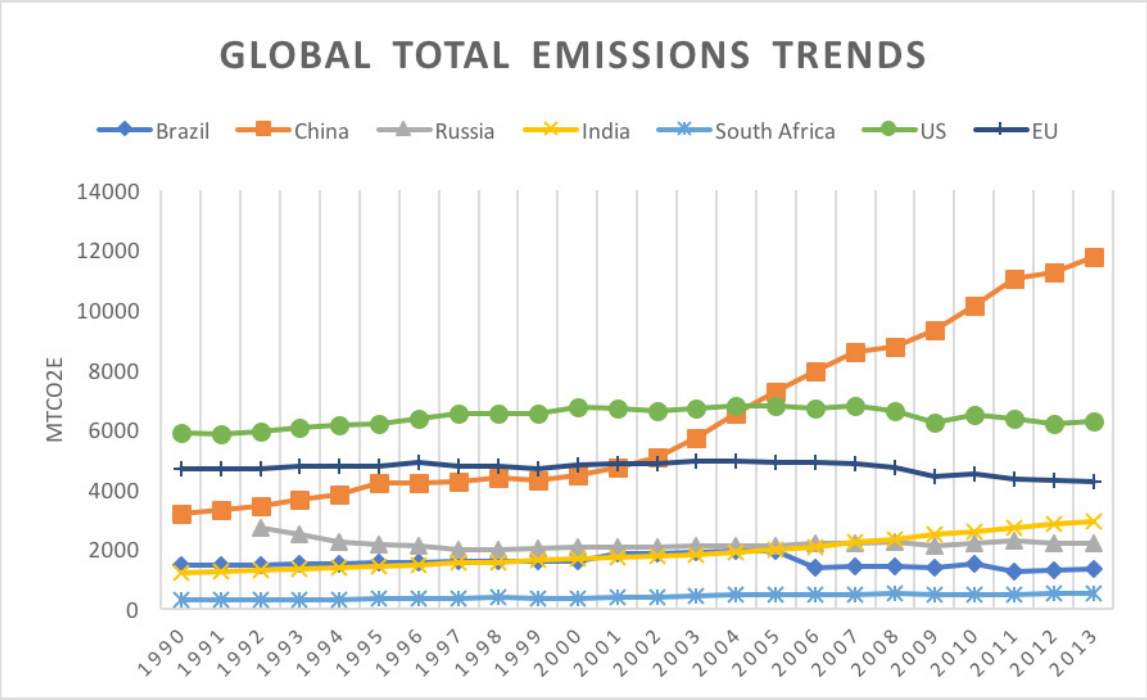


Figure 2 (Source: World Resources Institute CAIT Tool)

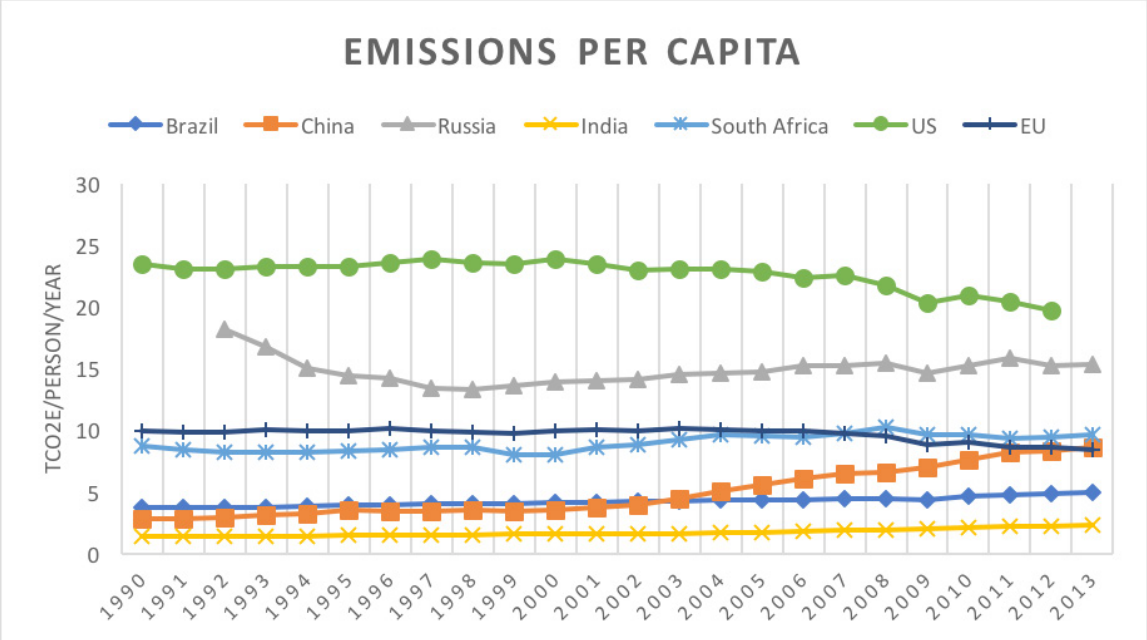


Figure 3 (Source: World Bank Population Statistics)

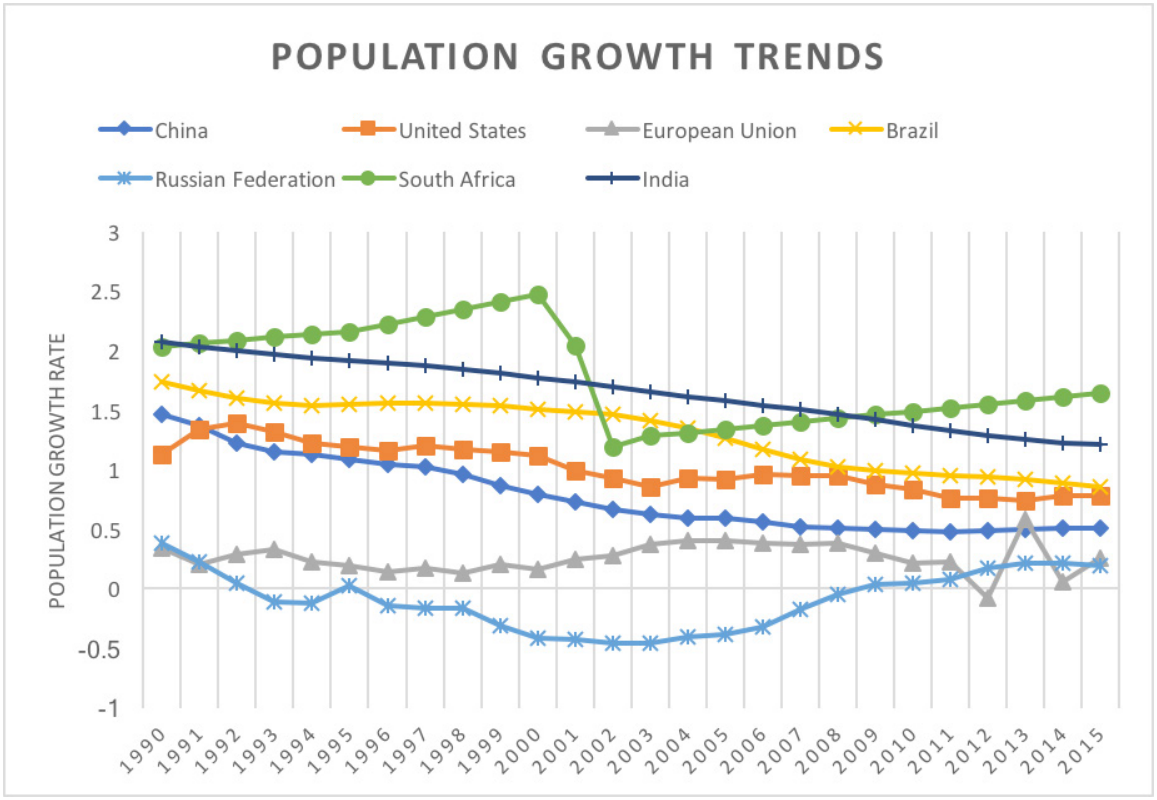


Figure 4 (Source: World Bank Population Statistics)

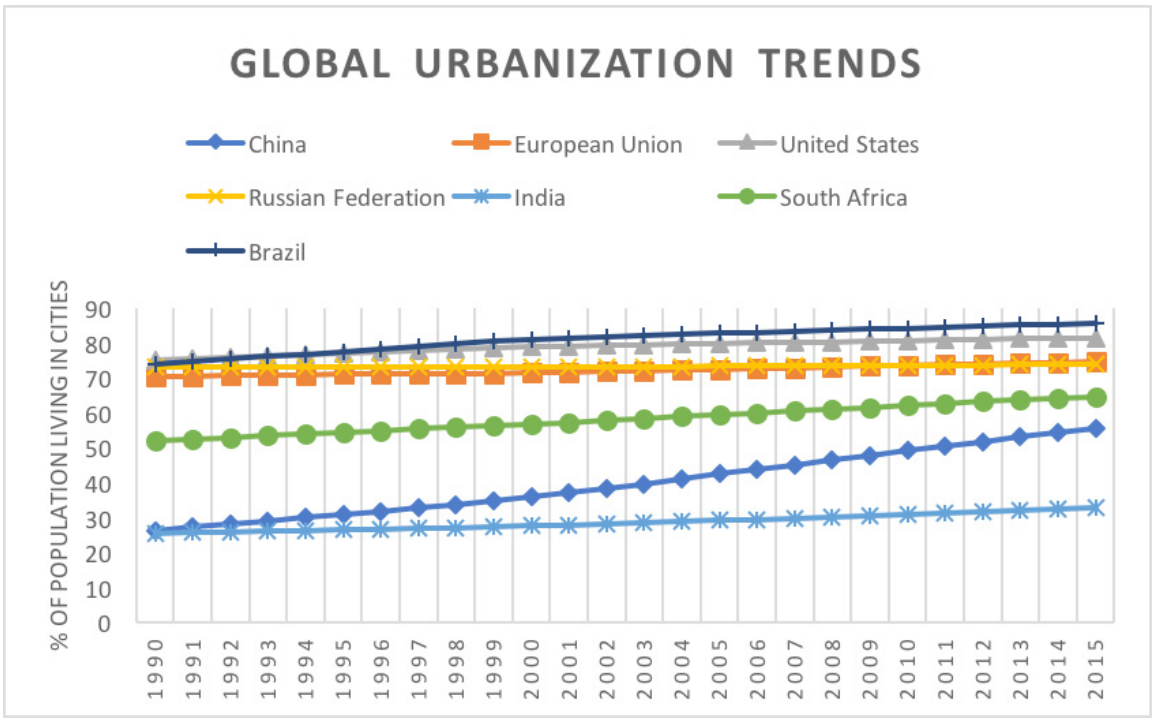


Figure 5 (Source: World Bank Income Statistics)

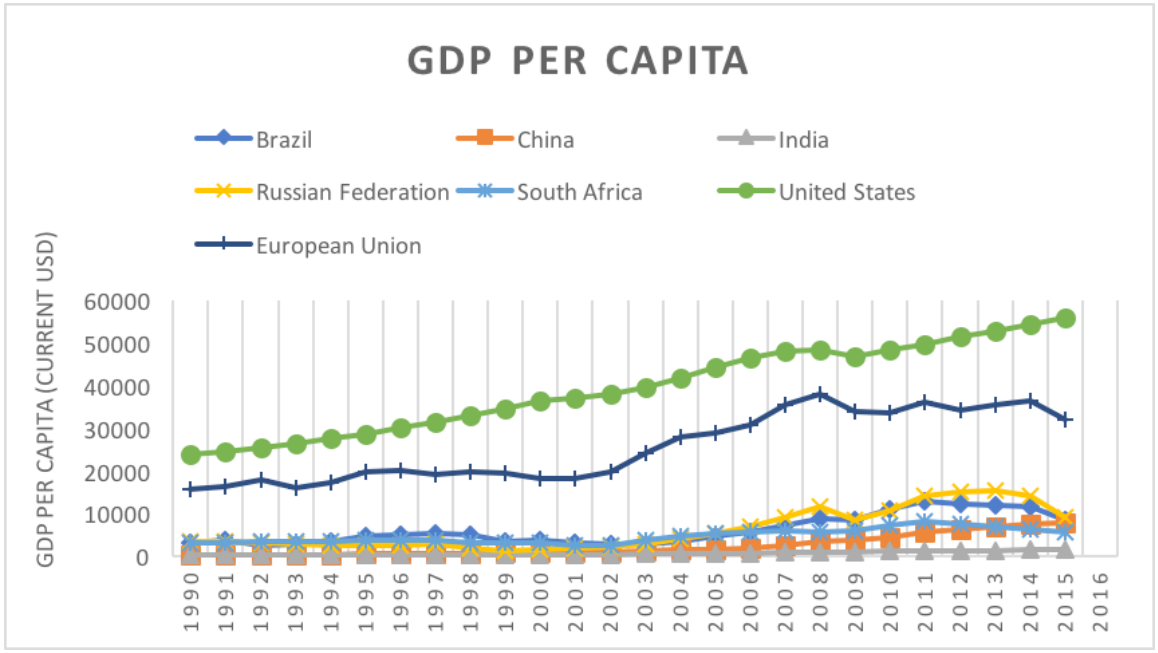


Figure 6 (Source: Enderdata Global Energy Statistical Yearbook 2017)

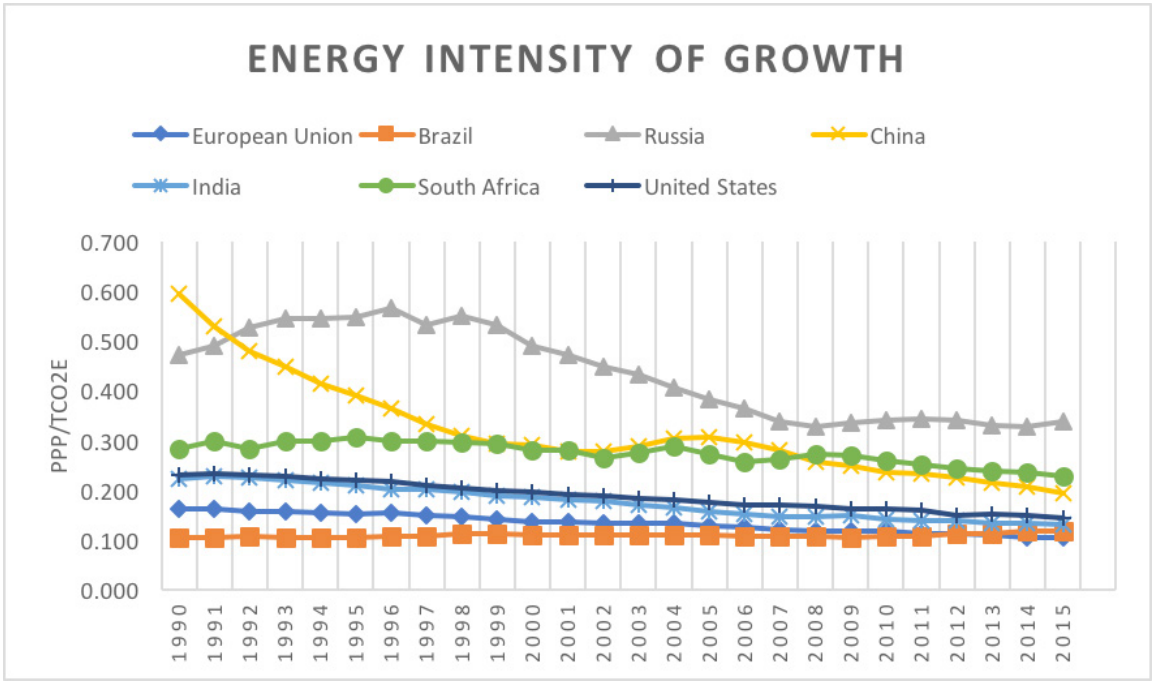


Figure 7 (Source: Enderdata Global Energy Statistical Yearbook 2017)

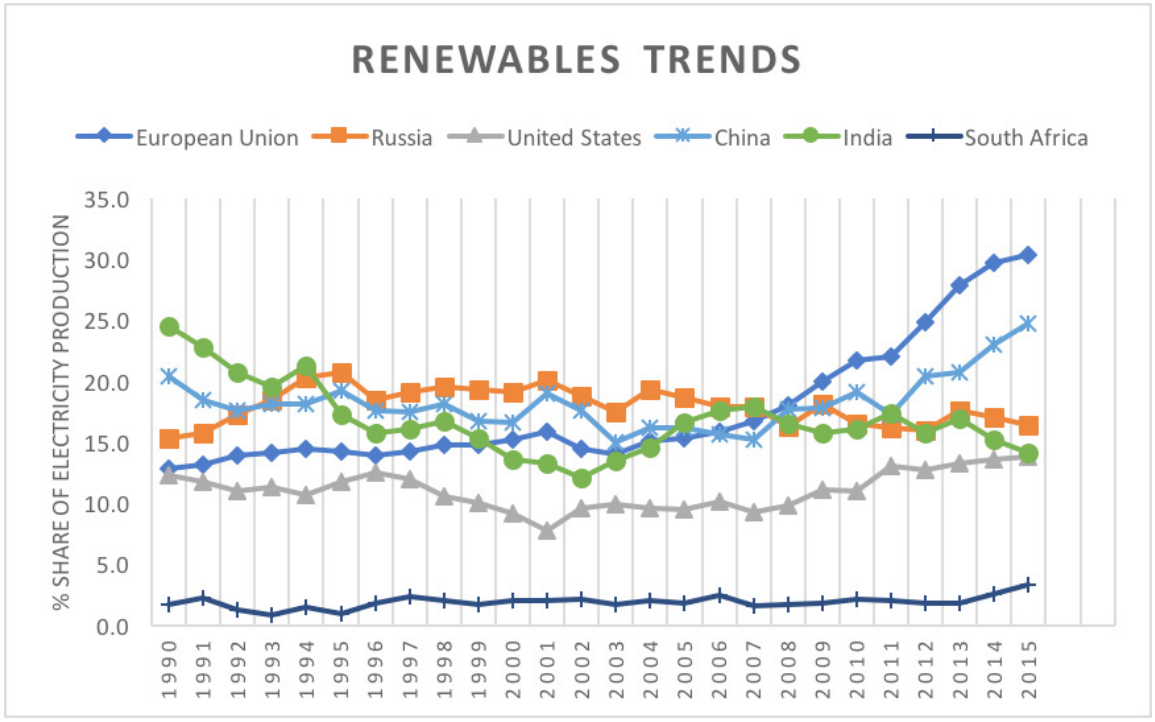
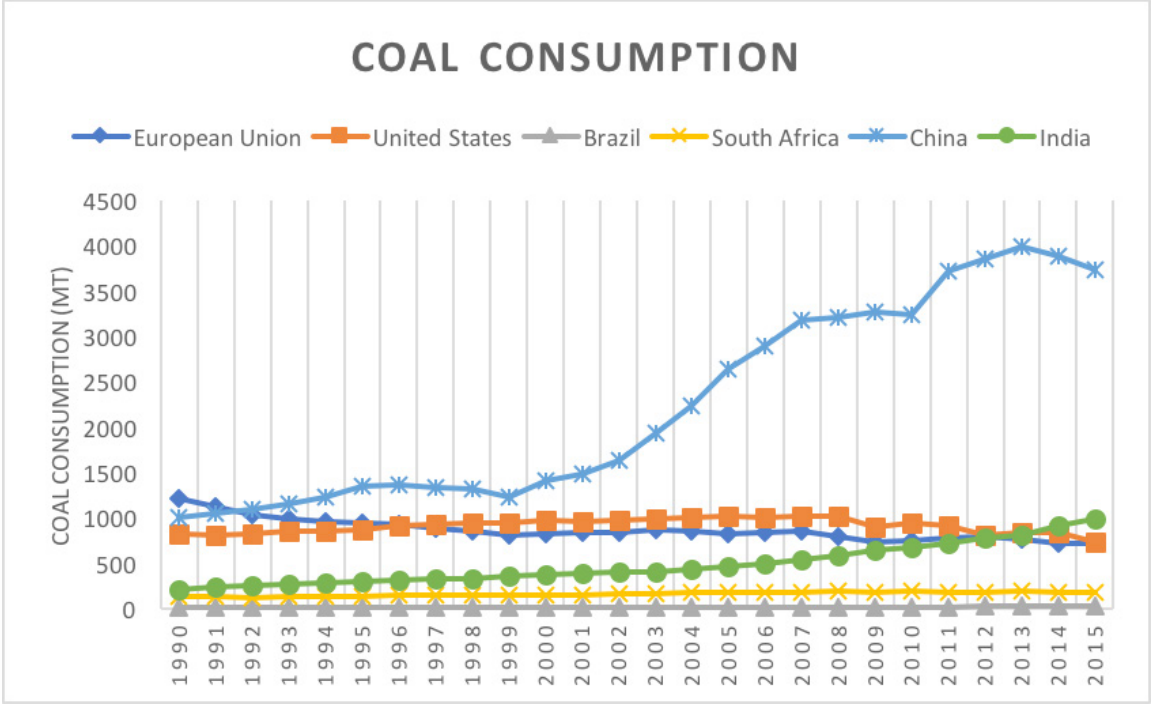


Figure 8 (Source: Enderdata Global Energy Statistical Yearbook 2017)



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