Green policies, a comparison between China, India and the EU, relating climate change policies to the governance and value systems in these countries

Meine Pieter van Dijk, Maastricht School of Management (MSM of UM, the Netherlands), dijkm@msm.nl & Subrata Dutta SPIESR (Sardar Patel Institute of Economic and Social Research in India). For theme 4: Public Policy and Regulation for Green Growth, The role of policies in encouraging green economic practices. V**ersion** 15-4-2026

Abstract

Green policies should guide the transition from an old polluting industrial economy based on fossil fuels to a more environmentally friendly way of producing industrial products, using digital technologies and alternative sources of energy. Climate change due to global warming has led to unprecedented weather extremes: heat waves, droughts, wildfires and cyclones, requiring policies, usually focusing on reducing CO_2 emissions. It triggered a process to formulate more green policies.

We review the experiences of China, the European Union and India. China promised to diminish emissions as of 2030 and reach carbon neutrality in 2060, while India hopes to do so by 2035 and 2070 respectively. China is still increasing its power generation capacity using coal and until recently opened a coal fired electricity generating plant every two weeks, while India is still betting on exporting steel from polluting plants. The EU leads the fight against environmental degradation and climate change and has tough environmental legislation to achieve a 100% reduction by 2050. It has codified its objectives with respect to climate change in the Green deal.

A comparison is made between China, India and the EU, with respect to the policies, the economic and governance systems in these countries and the underlying values of the population. We ask the question: what are the underlying values in these three countries and how do preferences at the household level get translated into policies to fight pollution and the negative consequences of climate change? Do these policies achieve the objectives formulated?

Governance and economic systems affect the outcome of green policies. Values are translated in attitudes towards the natural world and expressed in politics. We study the underlying values of Christianity (dominant in the EU), Confucianism (important in China) and Hinduism (in India) to determine the attitude towards green policies and assess what that means at the national level (objectives and policies) and at the international level (participation in international agreements).

Introduction: what does climate change mean and what are the causes?

Climate change means higher temperatures, more or less rain, more volatility in rainfall. Climate change has led to a dramatic increase of the number of cases of extreme weather, such as heat waves (Zhang et al., 2019), droughts (Van den Boorn and Van Dijk, 1982), floods, the rise of the sea level and bush fires according to the Intergovernmental Panel on Climate Change (IPCC, 2021). It changes the water cycle leading to more water (floods) or less water (droughts) in certain regions. Higher temperature also leads to more evaporation, changing the water cycle. Also the frequency and intensity of cyclones and tsunamis has increased.

The world is spewing more than 100 million of carbon dioxide a day now. CO_2 is the principal greenhouse gas, which contributes about 50% of the total global warming effect and other climate changes. 2015 saw the largest annual increase in CO_2 in decades. People have always adapted to new climatic circumstances and we can learn from their experiences (Hao Li and Van Dijk, 2012). We will compare the efforts of China, the EU and India and try each time to relate current policies to the underlying social and economic system of the country or block concerned.

Researchers agree that human interventions have contributed to climate change. Land and water systems function differently after building dams and dikes. Also agriculture, transport and industries contribute to emissions of CO_2 and methane and affect climate change. Because of the behavior of human beings, using fossil fuels we notice climate change and less biodiversity.

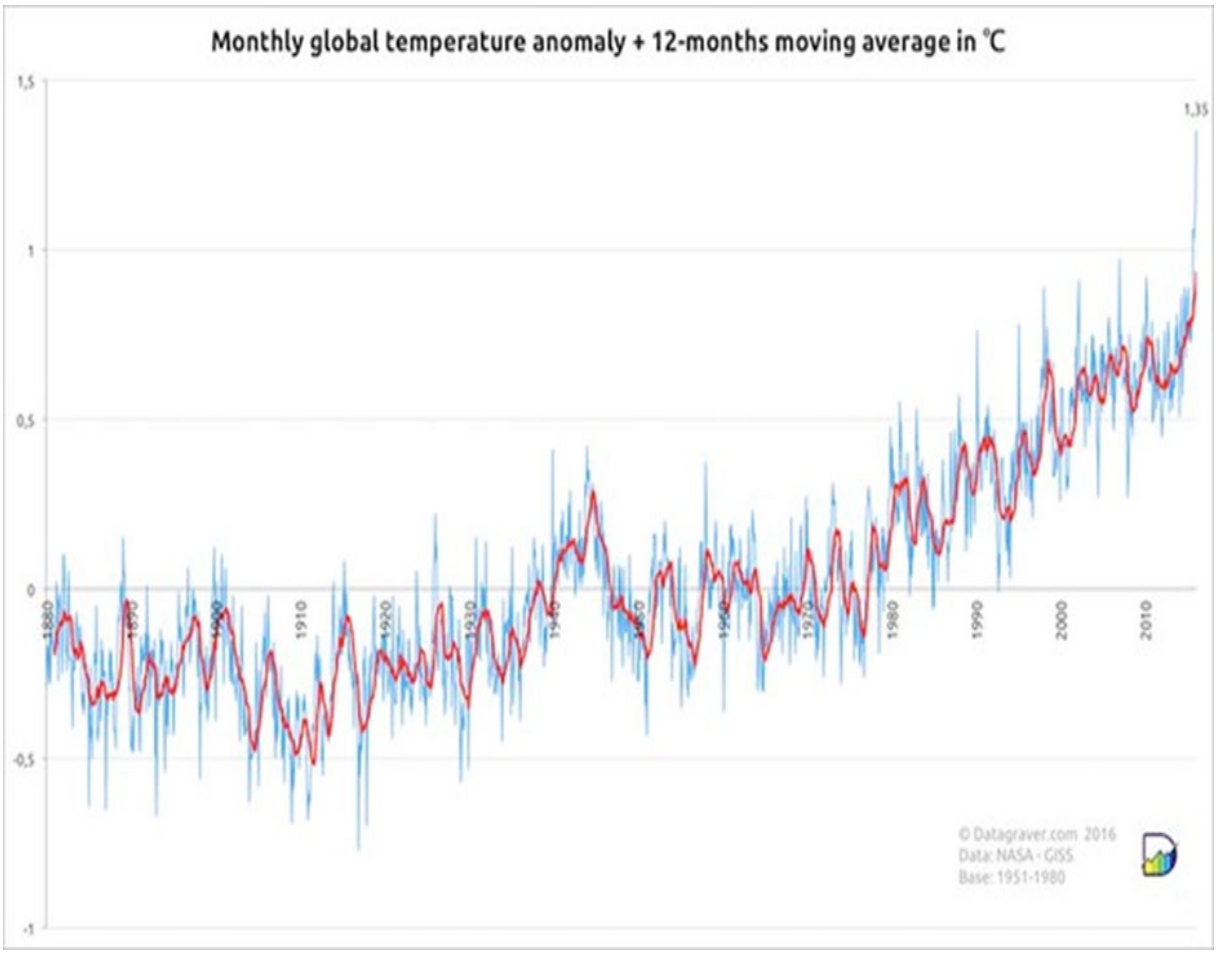
The International Panel on Climate Change (IPCC, 2021) of the United Nations (UN) warned that the temperature is rising and that this will have severe consequences for every part of the world. According to the UN the temperature is increasing (Financial Times, 22-11-2023). Hence policies and other measures are necessary to avoid more problems. The report provides an updated global assessment of climate change mitigation progress and pledges, and examines the sources of global emissions. IPCC (2007) estimated that the “global average surface temperature will rise between 1.48C and 5.88C by the year 2100 whereas the average temperature rise during the last century averaged only 0.748C.” Hence the “world is on track for a temperature rise of up to 2.9C above pre-industrial levels”, despite the agreements made in Paris in 2015 to reduce green gas emissions and hence global warming. According to the NRC (5-4-2024: E3) emissions have increased since the agreement in Paris.

Global warming leads to melting of ice and snow. The average glacier has lost 12 meters of thickness since 1997. Ever since the rate of ice sheet collapse is increasing. The Greenland ice sheet lost 5.2 trillion tons of ice from 1993 to 2018. According to a study quoted in the Proceedings of the National Academy of Sciences, the Antarctic ice sheet lost 3 trillion tons of ice from 1992 to 2017.

Climate experts unanimously agree that reducing CO_2 emissions is essential to prevent the Earth's temperature from rising by more than 3 degrees. The world wants to remain below 1.5%. The UN climate chief was gloomy on achieving this objective for global warming very rapidly (FT 26-1-2023: 4).

In the agreement reached in Paris in 2015 195 countries decided to reduce global warming to 2 degrees Celsius. The agreement fixed concrete objectives for most countries present, including China, the EU, India and the US. This leads to two important issues: how to reduce greenhouse gas emissions and in particular CO_2 emissions and how can the world adapt to the new situation (climate adaptation)?

Figure 1 Temperature fluctuations between 1880 and 2010



Given different crises in the world, climate issues have fallen down on the policy agenda. This paper deals with the transition from an old polluting industrial development based on fossil fuels to a more environmentally friendly way of producing industrial products, using digital technologies and alternative sources of energy (Zhang et al., 2018b). This green economy, taken as efforts to achieve carbon neutrality, is not yet a reality in China, the EU and India.

Methodology

A comparison between China, India and the EU is made with respect to their green policies, relating these policies to the governance, economic and value systems in these countries. We ask the question: what is the underlying economic and social model in these three cases? Do these policies reflect the values of the population and how do the agreed policies affect the objectives formulated for these green policies?

Use is made of secondary data, previous research by the authors, and publications in the field of climate change in the countries concerned. How societies respond to environmental challenges and climate change depends largely on the behavior of human beings (Thaler and Sunstein, 2009), acting individually or collectively (Tietenberg and Lewis, 2021: 6). Key indicators for comparative economic analysis are the underlying philosophy of the economic and political system and the virtues valued by its population. The political system may be based on communism, socialism, or different types of capitalism, but it is always based on shared values. The preferences of the people play a role, but are expressed differently in different political systems. The political system is often just translating the opinion of those in power, and not necessarily the preferences of the common people, into appropriate policies and regulations with respect to the environment and climate change.

What are the underlying values of European, Chinese and Indian citizens? We consider them to be based on the major religion of the inhabitants: Christianity, Confucianism and Hinduism in the EU, China and India, respectively. We focus on the five most important values of these religions (table 1) and try to link them to their relation with nature in the same table. The analysis will be at three levels: the micro (households and enterprises), meso, or at the national level, and the macro level or the international level in the form of signing agreements and respecting them. What are the shared values in each of these countries? In the analysis we will try to find indications that local values are reflected in the priorities and policies with respect to the environment and climate change.

The theoretical framework

In table 1 a Christian country (the EU), a Confucian and a Hindu country are compared on what the main value system states about what is expected from the individual and what about the relation between the inhabitants and society? After mentioning some other values different attitudes towards the environment are listed.

Table 1 Basic values of Christianity, Confucianism and Hinduism compared

Basic values of:	Christianity	Confucianism	Hinduism
Concerning the position of individuals	Love your neighbors	Benevolence	Act out of duty
Concerning society at large	Compassion& justice	Compassion and righteousness	Ethical living
Other important values	Integrity & humility	Ritual, wisdom and trustworthiness	Non-injury, karma (cause & effect), truthfulness
Attitude towards the environment	Stewards, managing the earth responsibly	Humans are part of nature	Interconnectedness of all life

We will not discuss the policies of the current government in the US, since president Trump left the Paris agreement for the second time after his reelection in 2024. Unfortunately, this dismantling of green rules prompted other nations (and some big international companies) to weaken their commitments (FT 31-12-2025: 4) and “climate deals imperiled after Trump election win emboldens allies” (FT 18-11-24 1). Nationally determined contributions (NDCs), required under the Paris agreement, have become less ambitious, while the world is on a course to overshoot the lower temperature limits of the Paris agreement (1.5 C since pre-industrial times).

President Biden immediately joined the Paris agreement when he succeeded Trump I. The policies of the US clearly reflect the different points of view of the democratic and republican party. In the Republican party one finds many who are denying climate change and don’t want to take responsibility for our behavior in the past. Interestingly some US states want to continue respecting the Paris agreement (California, for example, which is also on its own the eight economy in the world).

For Christians the Earth belongs to God, and human beings are stewards responsible for cultivating, protecting, and managing it responsibly. This is based on the book Genesis in the Bible (2:15). The ethos of caring about the creation calls for preserving nature's balance, avoiding wasteful exploitation and consumption, while ensuring sustainability for future generations.

Confucianism emphasizes five virtues or core values: Ren (Benevolence), Yi (Righteousness), Li (Propriety), Zhi (Wisdom) and Xin (Trustworthiness). Daoism emphasizes the harmony between human beings and nature. The Confucians consider that human beings are part of nature.

Basic values in Hinduism are the values of dharma (ethics/duty), karma (cause and effect), moksha (liberation), and ahimsa (non-violence). These are also called eternal principles. Hindus believe in the interconnectedness of all life, which means improving nature will also improve human life.

In practice the behavior of the people we meet, may differ from the religions mentioned. However, in most cultures opinions are shared for a longtime, sometimes against actual evidence. They are the basis for acting. Table 2 lists the theories concerning the green economy, used at the micro, meso and macro level for which we will present the evidence in the three cases studied. As an indicator for the micro level activities, we will mention per country the per capita solar panels installed.

Table 2 Theories concerning the green economy, used at the micro, meso and macro level

Level	Relevant theories
Micro level: individuals, households & enterprises	Behavioral theories assuming people's behavior is guided by shared values
Meso level of the nation state	Democracy expresses priorities of population concerning environment and climate change
Macro, international	Theories concerning climate change (IPCC, 2021) and the Kuznets relation between the level of development and environmental action

At the meso level governance systems expresses the priorities of the population concerning environment and climate change. They need to be turned into relevant policies (Fukuyama, 2011). At the macro level theories concerning climate change (IPCC, 2021) and Kuznets' relation between the level of development and environmental actions are relevant. The Environmental Kuznets Curve (EKC) hypothesis suggests that environmental quality deteriorates in the early stages of economic growth due to rise in pollution emissions, but improves beyond a certain per capita income threshold (Andreoni and Levinson, 2001).

Poorer economies in early development stages tend to rely on environmentally harmful technologies, leading to increased pollution, greenhouse gas emissions, and carbon footprints as income rises (Grossman and Krueger, 1991, 1995; Shafik and Bandyopadhyay, 1992). Middle-income countries (such as Saudi Arabia and Egypt) often exhibit the highest levels of environmental degradation. At advanced stages of development, demand for environmental quality increases, encouraging investment, innovation, and research in cleaner production technologies (Deacon and Norman, 2004; Bo, 2011). Highly developed economies increasingly adopt environmentally friendly technologies due to greater awareness of the social costs of environmental damage. The next section provides an overview for all the three countries of their emission goals and ambitions to deal with climate change.

Actual emissions, objectives for the future and reduction promised per region

Total emissions in the world in 2012 were 47,599 megaton, with China as the biggest emitter, the US as number two and the EU and India as number 3 and 4. The G-20 countries are responsible for almost 80% of the global emissions.

Table 3 Actual emissions, objectives for the future and reduction promised per region

Region & emission in base year1990	Actual emissions	Reduction in megaton in Paris (NRC,1-10-2015)	Year to achieve this
China	Plus 5% in 2023	Promised 10,684	Carbon neutrality by 2060, as of 2030 reductions
EU	15.5% emissions reduction in 2023 & 37% in 2024 Economist 27-4-24	Promised 4,123	100% lower in 2050, 55% lower in 2030
India	India is third in terms of emissions	Promised 2,887	2070
United States	Second, after China	Promised 5,823	No ambition any more at Federal level

UN Climate Change Conferences (UN-FCCC) take stock of the progress of the Paris agreement. They are also called the conference of parties. For that purpose the COP30 took place in 2025 in Belém, in Brasil, 10 years after the Paris agreement. The COP 29 was held in Baku the capital of Azerbaijan in 2024 and concerned in particular the financing of the efforts to reduce global warming in the South. The theme was financing climate change prevention and adaptation. The objective was raising money. $1100 billion is the total need. $300 billion would be necessary by 2030. The actual contribution is currently $100 bn per year The earlier goals of spending $100 bn per year have been reached, but two years later than anticipated, according to the OECD.

We will now analyze, in alphabetical order, China, the EU and India, paying attention each time to:

a. The commitment expressed internationally and the achievements at the macro level
b. The general situation with respect to the environment and the national climate change policies (meso level)
c. At the micro level, the role of underlying values and beliefs

China

a. Macro level: the international commitment and the achievements

China's economy is extremely polluting and the country is the biggest emitter of CO_2 in the world. China considered climate change for a long time the problem of the developed countries and only in Paris in 2015 it promised to cooperate with other countries. Environmental problems were largely neglected during the early phases of its development process (Van Dijk and Zhang, 2005).

However, China committed itself in Paris to reducing carbon emissions after 2030. It intends to reach carbon neutrality by 2060. China emits a quarter of the world's greenhouse gases each year. According to the Economist (16-3-2024: 48) China's emissions rose by 5% in 2023, half of it coming from the power sector, which is dominated by coal-fired plants. Over half of China's energy comes from burning coal.

China is committed to multilateral agreements concerning climate change, like the Paris agreement of 2015. China has revamped its carbon credit trade system in 2024 (China Daily 23-1-2024: 4) and added 240 gigawatt of solar and 61 gigawatt of wind energy in the first 9 months of 2025 (FT, 12-11-2025: 4). Since March of that year total emissions are about 12000 megaton of CO_2 per month. That could mean that China will reach the peak in emissions earlier than the 2030 promised in Paris in

2015. At the end of 2025 China reported to UN COP30 climate summit that its CO_2 emissions were largely flat over the last 1.5 years (FT 12-11-25: 4). Carbon markets and offsets are designed to commodify emission reductions. They face intense scrutiny regarding climate and economic justice. They are mobilizing funds for developing nations (where results can be booked with smaller investments). However, critics argue this approach offers "false solutions", since they allow companies in China or the EU to avoid direct emission cuts. The argument is: Carbon offsets don't stop climate change because they don't stop emissions. Two factors mentioned for these results:

1. Slower economic growth in the manufacturing and the construction sector
2. A surge in renewable energy and electric vehicles, absorbing additional electricity demand

b. ***The meso level: national policies***

China is also a green-technology powerhouse producing most solar panels, batteries and electric vehicles in the world. The country also produces more renewable power than any other country. However, China is still increasing its power generation capacity with coal fired plants and until recently opened a coal fired electricity generating plant every two weeks. The challenge is transitioning from an old polluting industrial sector using fossil fuels to the green economy of alternative sources of energy and less polluting industrial technologies. China considers this a challenge and would like to be very competitive in all green technologies in the near future.

c. The underlying values and beliefs and governance structures

After Mao's death Deng Xiaoping started liberalizing the economy. It seemed that the major moral value of the Chinese population in the 80s and 90s was getting rich quickly. China has over a million millionaires and every two weeks there is a new billionaire. For a long time economic growth went at the expense of the environment.

This attitude has changed in the 21st century and in 2024 this idea of harmony between humanity and nature is expressed in an official annual speech by the Chinese prime minister, Li Qiang (Economist 16-3-2024: 48). The government supports all kind of green industries and promotes alternative sources of power in a big way. At the individual level many Chinese households try to save energy and water and recycle waste. Also electric cars are very popular. Early 2026, China has surpassed 1,000 watts of solar capacity per capita, amounting to roughly 2.5 standard 400W panels per person. China has become the world leader in both total and per capita growth rate, adding 210 GW of new solar in the first half of 2025 alone (www.google.nl; 10-4-2026).

The EU

a. The macro level: international commitments and the achievements

The EU tries to lead the fight against environmental degradation and climate change and has already tough environmental and climate change related legislation. It codified its objectives with respect to climate change in the Green deal (Van Dijk, 2021) during the first period of Mrs. Van der Leyen as president of the European Commission. It is currently struggling to achieve these ambitious plans. In the current situation some of the ambitions have been scaled down, such as eliminating fuel using cars by 2030. However, as will be argued below, in the EU shared values seem to favor more rigorous climate policies.

During the second period as president of the European Commission Mrs. Von der Leyen had to pay more attention to defense issues because of the war in the Ukraine. EU countries struggled to agree a climate target for 2040 and landed at a 90% emission reduction goal, including international carbon

effects. In December 2025 the Commission proposed that the block scraps its ban on new combustion engines as of 2035. This allows manufacturers to continue to produce fossil fuel using cars, if 'they use green steel or sustainable fuels'.

Individual countries may have their own specific problems and solutions. In the Netherlands, where half of the country lays below sea level specific policies have been designed: governments provide no building permits for lower lying areas, they promote the installation of heat exchange systems with the underground, they promote storing rainwater, promote rain water harvesting and separating grey and brown water. It is important to consider climate adaptation policies at different geographical levels: at the national, the city, the neighbourhood and even the household level.

b. The meso level: governance for climate change policies

The EU is the fastest warming continent. Table 1 shows the actual situation, the objectives and the achievements. Results stem from using more alternative sources of energy (wind and solar), and less coal according to the EU Environmental Agency (EEA). In 2005 only 10% of the energy requirements of the EU came from sustainable energy generation. This percentage has increased to 30 by 2023 and over 50 in 2025 (NRC 1-11-24). Industry reduced its emissions with one-third in twenty years and the European Emission Trading System (ETS; Zhang et al., 2018a) also contributed to lower emissions. Other sectors (agriculture, transport, construction and waste) show lower reductions.

Positive EU policies in 2026 to prevent the negative effects of climate change:

1. The carbon border tax (CBAM) came into force for certain sectors
2. Solar storage projects were rolled out
3. Companies must disclose more climate data
4. Fossil fuels discussions resulted in efforts to try to phase out fossil fuels over time
5. The development of electric vehicles is promoted by providing subsidies

However, the EU also delayed for a second time the introduction of an important law aiming at halting deforestation. It also postponed the start of a second emissions trading system dealing with road transport and housing. CO_2 capture (CCS) policies failed despite financial support from the EU (NRC 24-10-18 E1). Finally it made some of the policies of the Green deal less strict, changing the indicator value or the year an objective had to be achieved.

c. The underlying values and beliefs and governance structures

The underlying model of the EU capitalist economy is the Rheinland-Westfalen model, where workers and employers periodically meet to discuss issues of general interest for society. Van der Wal (2018) claims there is such a thing as the soul of Europe and he calls it the European humanity. It is the combination of the rationality of the renaissance combined with the romanticism of the 18th century.

Given its Catholic roots, values like love for your neighbor and fighting for justice are very important. The Protestant Churches in the Netherland (PKN) reflect the words of the Catholic Pope. The Pope links environmental sustainability to justice. The encyclical is an official, authoritative letter written by the Pope and sent to bishops, clergy, and the faithful, usually addressing specific doctrinal, pastoral, or social issues. On the website of the Pope it is stated that "the IPCC report makes it very clear that we are destroying the creation of our Lord".

According to a recent verdict of the International Court of Justice in the Hague: "countries are obliged to do everything against climate change". (Volkskrant, 24-7-2025:22). This verdict reflects the underlying values and beliefs in the EU that we are collectively responsible for the crisis and should

solve it together. According to google, The Netherlands leads Europe in solar capacity per capita, with approximately 1,477 watts per person, driven by aggressive rooftop solar policies. Germany and Austria follow, with most top-ranking countries focusing on high per-capita deployment to meet European green energy targets. Although the average for the EU may be lower than China, the leading countries have achieved more than the 1000 watt which have been installed in per capita terms in China.

India

a. Macro level commitments with respect to climate change

The green economy, taken as efforts to achieve carbon neutrality, is not yet a reality in India, which is for example still trying to increase its share in world steel production by producing cheap steel using outdated technology and abundant local coal, not hindered by environmental regulation. It is doubtful whether India will reach its climate goals in these conditions. It is difficult to know the real commitment. The Financial Times reports on dirty steel, suggesting it is not yet a priority.

However, given the EU's policies India will have to comply with these regulations in the near future, or pay the carbon border tax (CBAM). The new agreement signed recently with the EU contains a number of regulations with respect to industrial pollution and climate policies which need to be respected. The imposition of a carbon border tax for dirty steel will discourage Indian steel exports to the EU and possibly stimulate the necessary investments in clean production.

b. The meso level: climate change policies

The general situation with respect to climate and climate change policies is difficult to assess in a big country with different levels of government actively pursuing environmental and climate change related policies. Achieving a green and circular economy is not yet a priority in India. The FT (26-11-2025: 15) notes that steel exports are pushed using coal and very polluting technologies: "the country has boosted production of the metal to support its buoyant economy, but its poorly regulated coal-powered plants are creating environmental and trade-related problems".

India tries to increase its share in the world steel market by producing more steel, using Indian coal and outdated technologies. However, India made clear recently that it hopes to achieve carbon neutrality by 2070 and some actions have been announced how to achieve this. India has a number of relevant policies to fight climate change and promote adaptation.

Dutta and Dinda (2023) find that coal has remained the dominant source of electricity generation, with its share rising from 65.34% in 1990 to 71.52% in 2020. As India's reliance on electricity is expected to increase in the coming years, indirect fossil fuel consumption associated with power generation must be reduced through the adoption of critical and super-critical boiler technologies in coal-fired power plants, along with minimizing transmission and distribution losses. A national roadmap that is to be bolstered by specific financial incentives, public-private partnerships, and specialized research infrastructure is needed to expedite the development and implementation of Carbon Capture, Utilization, and Storage (CCUS) technology (Singh et al., 2025). It is a set of technologies that act like a giant vacuum cleaner for pollution, catching carbon dioxide (CO_2) emissions from power plants and factories before they escape into the atmosphere. Once captured, this carbon is either safely locked away underground in liquid form (i.e. storage) or used to make new products (i.e. utilization).

India is one of the nine countries (others are China, the United States, Russia, Japan, South Korea, Turkey, Iran, and Ukraine) that lead in crude steel production and contribute more than three-

quarters of the global emissions of PM2.5, SO_2, NOx, and heavy metals from the iron and steel industry. As an individual country, China emitted, as reported by Zhang et al. (2023), more than 50% of the global iron and steel industry emissions, followed by India. India is the second-largest producer of crude steel globally, contributing 10-12% of the country's total emissions (Government of India, 2024). Due to rising steel production in India and substantial emission reductions in China in recent years, India became the world's largest SO_2 emitter in 2019, contributing 29% of global emissions (Zhang et al., 2023). The iron and steel industry accounts for approximately 25% of total industrial energy consumption in India (CSTEP, 2013). The average emissions intensity for steel in India is 2.54 t-CO_2/tcs, which is significantly higher than global average of 1.91 t-CO_2/tcs (Government of India, 2024).

About 93% of the total iron and 75% of total steel production in India is through coal-based processes. Coal dominates the sector's energy mix and is associated with high emission factors and low energy efficiency due to its high ash content of around 35% (Mandal and Madheswaran, 2010). Moreover, the energy efficiency of India's iron and steel sector is lower than that of its counterparts in developed countries. Producing one ton of crude steel in India requires about 6.9 Gcal of energy, compared with the global average of 4.5 Gcal per ton (TERI, 2013). Scrap utilization in steel production offers significant energy savings and greenhouse gas emission reductions by avoiding energy-intensive material preparation and iron-making processes. However, in India, the use of scrap in steelmaking remains limited due to its low availability, resulting in most steel being produced from hot metal and sponge iron. Scrap utilization refers to the recycling of steel scrap from various sources back into the steel-making process, which reduces dependence on primary raw materials, conserves energy, and lowers emissions. Given the high energy intensity of the sector, shifting toward greater scrap utilization is critical for enabling low-carbon growth and meeting national emission reduction targets (Government of India, 2024).

Many environmental protection measures involve substantial costs. While studies in developed nations suggest that the adoption of newer equipment is associated with improved environmental performance (Clarkson et al., 2008), this relationship may not hold in developing countries. Prasad and Mishra (2017) report that only 20% of the sampled firms disclosed research and development (R&D) expenditure, and that such disclosure is positively and significantly associated with firm size. Moreover, overall spending on R&D remains very limited.

For example, among the firms examined in their study, Steel Authority of India Limited (SAIL)—a public sector enterprise and one of India's largest steel producers, accounting for around 16% of the country's crude steel output—reported mean R&D expenditure of just 0.232% of sales during the period 2006–07 to 2011–12. Tata Steel, a private sector firm producing approximately 10% of the nation's crude steel, recorded an average R&D expenditure of 0.164% of sales. Smaller firms, such as Electrotherm (India) Ltd., spent even less, with mean R&D expenditure of only 0.07% of sales. This low level of R&D investment may partly reflect weak incentives to develop low-carbon technologies and processes, given the absence of stringent emission regulations and mandatory reporting requirements. Accordingly, policy interventions should encourage firms to increase research spending, particularly in areas related to raw materials and operational practices aimed at reducing emissions (Prasad and Mishra, 2017).

Against this backdrop, what does India aim for when it comes to reducing pollution in the environment? Unlike in previous industrial revolutions, the environmental damage caused by modern industrialization can be irreversible, such as biodiversity loss, deterioration of air quality, groundwater contamination, and the destruction of eco-systems. India is a fast-growing country and aims to reach carbon neutrality by 2070. This was announced by the Prime Minister Narendra Modi at the COP26

climate summit in Glasgow in November 2021, and it remains India's formal long-term climate target. But India has some short-term climate action targets as well. At COP26, India laid out its Panchamrit climate action plan as follows:

(1) India aims to expand its clean energy capacity (solar, wind, hydro, nuclear) to 500 gigawatts by the end of the decade.

(2) Half of the country's total energy needs are to come from renewable energy by 2030, signaling a major shift away from fossil fuels.

(3) India has pledged to cut its total projected carbon emissions by 1 billion tons from current forecasts by 2030.

(4) The goal is to lower emissions per unit of economic output (carbon intensity) by at least 45% relative to 2005 levels.

(5) India committed to reach carbon neutrality — balancing emissions with removal — by 2070.

India's net-zero carbon emission target by 2070 requires deep decarbonization of the country's power generation sector. India has committed to reducing its carbon emission concentration by approximately 30-35% by 2030 at the Paris Summit. The recent trends suggest that it might be difficult for India to achieve its short-term targets. Coal power generation contributes to more than 60% of the total power generation (Ding et al., 2025). India was the world's third-largest carbon emitter in 2023, and its energy demand is expected to double or even triple by 2040 compared with 2017 levels (IEA, 2021). India is endeavoring to meet the global goal of holding warming well below 2 degrees relative to the pre-industrial level. India's existing power generation is heavily dependent on high-emission coal plants, accounting for more than half in 2021 (IEA, 2022; Metcalf, 2021).

c. The micro level: underlying values and beliefs

As regards the public perceptions regarding environmental issues, Bakhtiari et al. (2014) opine that the motivations among the public to protect the environment may be related to people's eco-centric or anthropocentric attitude towards the environment. However, in developing countries, the value systems of a large section of the population are often closely tied to their livelihood and well-being reflected in agricultural production, land use, food security, migration and disease (Wheeler and von Braun, 2013; Carleton and Hsiang, 2016; De Chazal and Rounsevell, 2009; McMichael and Haines, 1997).

Politically aware and increasingly active Indian citizens have repeatedly asserted their demands through mass movements that strongly articulate concerns related to farmers' rights, women's rights, civil liberties, and, over the past two decades, the right to a safe environment and environmentally sustainable products. These movements are significant not only because they are partly enabled by a democratic political framework, but also because they reinforce democracy by amplifying voices that were previously marginalized or unheard. Furthermore, the rise of an assertive and independent media, the expansion of a dynamic NGO sector, and the role of an activist judiciary have together broadened and intensified the institutional channels through which new actors can advocate for environmental protection, often by working within the existing system (Agrawal and Yokozuka, 2002).

Diversity is certainly more present in India than in China, where 95% of the population is Han Chinese. If India counts some 1 billion Hindus, there are still 450 million Indians with other norms and values, convictions, culture and history. That implies that civil society is very diverse in India counting organizations like the Foundation for Ecological Security (FES, 2025), the Self Employed Women

Association (SEWA), or the Forum for the future, which often campaign in favor of appropriate environmental and climate policies. According to google India has rapidly increased its solar capacity to over 150GW by early 2026, ranking third globally. Despite this, the per capita solar capacity remains low at roughly 51–69 watts per person due to its massive population, though it is scaling up fast, with over 7 GW of residential rooftop solar already installed.

Discussion

At the micro level behavioral theories rightly emphasize the importance of incentives to guide and nudging to influence behavior of individuals. In Europe this has led to a large group of people aware of environmental problems and concerned about climate change. They are willing to adjust their behavior and support government initiatives. In India the relatively low level of development means people often have other priorities than environmental issues and climate change. In China the population seems to be more conscious about the importance of environmental issues and climate change and people have taken more initiatives at their level, ranging from sun boilers to buying electric cars.

At the meso level the political system is important, reflecting more or less what the people prefer. Even if they don't agree with the national policies, there is an opportunity to pursue a better environment or fight the effects of climate change at the private level. Sometimes because people see economic gains (solar panels in certain situations), sometimes because they are nudged in that direction (electric vehicles in the EU and China).

Middle-income countries (such as China and India) often exhibit the highest levels of environmental degradation. However, we have shown that at advanced stages of development, demand for environmental quality increases, encouraging investment, innovation, and research in cleaner production technologies. Thus, highly developed economies increasingly adopt environmentally friendly technologies due to greater awareness of the social costs of environmental damage.

At the macro level of international agreements, the EU and China are more aware of their role as examples for other countries. The Environmental Kuznets Curve (EKC) hypothesis rightly suggested that environmental quality deteriorates in the early stages of economic growth due to rise in pollution emissions. This was certainly the case in China and India. However, environmental quality also improves beyond a certain per capita income threshold as shown by the EU and again by China and India. Indeed, poorer economies in early development stages tend to rely on environmentally harmful technologies, leading to increased pollution, greenhouse gas emissions, and carbon footprints as income rises.

Conclusions

We compared the policies of China, India and the EU with respect to CO_2 emissions. There are initiatives at all the distinguished levels. All three countries are part of the Paris agreement, but have chosen different horizons for achieving carbon neutrality: 2050, 2060 or 2070. This reflects their level of development as suggested by Kuznets.

Comparing the EU to Indian Hindu nationalism (with a capitalist sector) and the Chinese political system (Socialism with Chinese characters) raises the issue: are the preferences of the people translated into policies? The EU and India are democratic systems, which translate the preferences of the population into policies, if other priorities did not dominate the elections. In China the government is more autonomous in deciding the priorities, but because of its important export sector it has to take the rules of the importing countries into account. The EU is an important

destination for Chinese products and serves as a regulatory power, in particular in the field of environmental and climate change.

We discussed climate policies mainly at the macro level. In practice the hard choices have to be made at the meso level for different sectors. We need policies to reduce CO_2 emissions in agriculture, in industrial activities, in transportation and construction. Given the necessary collaboration between the national, the regional and the local level these policies are difficult to coordinate and implement effectively.

In the end the consumers and producers have to be convinced that they have to adjust their behavior, to comply with the regulation or face the harsh reality of rising temperatures and increasing climate risks. At the same time they tend to be concerned and may look at their governments for the necessary policies, while doing their small things at the household or enterprise level. Usually climate disasters increase the consciousness of the people and push them to be more vocal.

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