

Green Economy: An Opportunity for Sustainable Growth of Asian Countries

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Abstract

Asian countries are growing with rapid pace and competing with European and Western Countries in order to make their presence felt in the global market. Globally demand of goods and services from Asian countries has been consistently increasing since the last decade many due to low production cost. With the increase in population, need and demand of various products and services required for maintenance of quality of life is also increasing. This paradigm shift has put burden on the environment of this region. Increases in economic growth has also led to rise in carbon emission. Moving toward greener economy is the need of hour. We must take steps to ensure that our manufacturing and production aimed toward economic growth and development is adopting greener practices like conserving energy, reducing carbon emission, minimising wastage of resources and minimising all types of pollution.

This paper attempts to assess the carbon emission of Asian countries and tries to find out association between carbon emission and economic growth (GDP) of these countries. In Asia, there are huge differences among countries in term of demography, stage of economic development and other economic indicators due to which the impact of economic activity on environment is also different. The perception and approach of Asian countries toward the link of economic development and environmental degradation, too is extremely different. The paper also intends to find out the various policies adopted by Asian countries to maintain the balance between economy and environment. Further opportunities with respect to solar and wind energy needs to be explored to reduce carbon emission and conserve the environment.

Keywords: Climate change, economic growth, energy, environment,

Introduction:

When we talk about “green”, we talk about green ideologies (Stavrakakis, 1997). Ideologies reflects about the existence of an environment, ecosystem surrounding the mankind. In our Vedas and Upanishdas clearly mentioned about environment and its importance for mankind.

“madhu vātāḥ ṛitāyate madhu kṣaranti sindhavaḥ mādviḥ naḥ santuṣadhi. madhu naktamutusāsu madhumatpārthiva rajah madhu kṣorastu suryah mādhirgābo bhavantu naḥ” (Rigveda,1/90/6,7,8)

“Environment provides bliss to people leading their life perfectly. Rivers bliss us with sacred water and provide us health, night, morning, vegetation. Sun bliss us with peaceful life. Our cows provide us milk). The plant ecology has a great importance to keep the environment in balance”.

“jābadināni tulashi rūpitāpi jad grihe grihe. tābadvarṣha sahasrāni vaikunthe sa mahīyate” (Vṛkṣhāyurveda-9)

“The fire and Sun play the most significant role in the purification of environment. Animals and birds are part of nature and environment. The Vedic seers have mentioned about their characteristics and activities and have desired their welfare. Rig-Vedic seers classifies them in three groups sky animals like birds, forest animals and animals in human habitation”. (Sarmah, 2015)

With rapid population growth, demand of products and services also increases. But land is natural resource which is fixed. Therefore, deforestation increases worldwide more agricultural land and for other activities. With increase in cutting of forest area effect the climate and environmental system. This causes more green house effect and outcome of Green Economic movement (Heshmati, 2018).

Green Economy:

The word "green economy" has a variety of meanings and is currently developing as a concept. The Rio+20 Conference's Outcome Document states that a green economy "should contribute to poverty eradication as well as sustained economic growth, enhancing social inclusion, improving human welfare, and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's ecosystems." 2 Rising oil prices, the 2008 financial crisis, and the ever-increasing debate about global ecological concerns, such as climate change, can all be considered as major catalysts for the pursuit of green growth (National & Pillars, n.d.).The financial services sector's participation in the development of the green economy is critical(Barbier & Markandya, 2013).

Every economist understands that the gross domestic product (GDP) is a flawed indicator of human well-being. Its proponents will point out that GDP is favourably connected with many aspects of human welfare, making it a good proxy for the issues that matter to society. However, such association is far from perfect in the case of the natural environment. Indeed, a rise in economic activity is frequently accompanied by a drop in environmental quality. The growing cities of developing Asia are a striking case in point for air pollution (Fankhauser et al., 2017). The quest for green growth is a direct result of these realisations. Its goal is to boost economic activity while also safeguarding natural resources so that future generations can exist and develop. Green growth, more than sustainable development, highlights the capability, if not the desire, of achieving economic expansion while also protecting the environment (Jacobs, 2012)It rose to prominence as a response to the idea that economic recovery should take precedence over environmental protection following the 2008 financial crisis. Green growth advocates replied that the two must, in fact, work together ((Bowen & Stern, 2010). They may point to a global green economy that is fast growing and outperforming many traditional industries. Commentators, on the other hand, make the following points. The major green stimulus packages that numerous Asian countries put in place in the aftermath of the economic crisis with strong "green" aspects should be continued in order to achieve sustainable development, particularly in terms of the environment. Dynamic Asian countries have clearly expanded public investment in green infrastructure, particularly in public transportation, low-carbon energy production, smart electricity networks, public-building energy efficiency, and water and sanitation infrastructure (Mustapha, 2016).

A Journal for New Zealand Herpetology

Review of Literature

A UNEP report titled 'Green Economy Pathways to sustainable development and Poverty Eradication' defines green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities." This simple definition of green economy indicates that an economy can be considered as green economy if it is low on carbon emission, is efficiently utilizing its resources keeping in consideration requirement of coming generations and is socially inclusive in its approach. Another UNEP report also claims that rate of growth is faster in green economy in comparison to brown economy, and green economy also maintain and restore environmental capital

Green economy or sustainable development has been the buzzword since several years. Earlier it was assumed that development comes at the cost of environment, however there are examples that have shown that economic growth is possible along with environmental consideration. Interesting the approach has got substantial shift, it isn't simply imaginable to have flourishing, position and comprehensive development in a low-carbon economy yet in addition that a low-carbon economy is the main way that we will lead to a flourishing, and developing economy. The green economy now can be characterised by presence of for aspect that are interconnected and dependent on each other "increasing economic growth", "reducing unemployment" "increasing social inclusion and equity" and "reducing greenhouse emissions" (*No Title 学姐单词*, n.d.).

Per capita emission of CO₂ in South Asian countries (except Afghanistan) is expected to increase by 2 to 6 times between 2005 to 2030. This is majorly due to extensive dependence on fossil fuel. Technology directed approach aimed to be more competitive, like that adopted by Germany and South Korea, is not feasible for South-Asian region due to poor level of advancement, scarcity of resources (mainly financial) and high level of restriction and control prevailing in several countries. The main issues pertaining o this region are slow economic growth, poverty and it seems these they would continue to bother this region for some more time to come. It thus become a general expectation that the investments in green economy would also lead to resolving problem of growth and poverty. A critical aspect in this regard is adoption of low carbon technology, such technology is costly and may be out if reach of several (National & Pillars, n.d.).

The growth that is being witnessed in Asian region is being achieved at the expense of harm to the environment. The rapid growth being targeted by Asian nations is coming at the cost of rapidly depleting resource reserve and pollution of the environment. It has led to draining of non-renewable resources, pollution of water bodies and reduction in green cover area. The emission of green-house gases is also rising leading to rise in temperatures, it is estimated that if controlled measures are not taken and businesses continue to be operated at the current levels Asian countries will contribute to 50% of green-house gas emission by the year 2030. Although step in regard to control of emission have been taken, these are still not widely adopted by countries of the region. An impactful way to control emission is the region wide levy of "Carbon tax", a tax that has promising potential curtail emission through sensible use of resources the region is seen some measures to control emission (Dulal et al., 2015).

Data and methods

Data and sample selection

The data was collected for the sample of 10 countries which we have selected according to their latest GDP as an indicator. Next, we collect the data related to the rate carbon emission from the selected countries. Time span of ten years for 2010 to 2020 has considered. Analysis of the study has done with the help of statistical tools as regression and graphs.

Economic Indicator: These characteristics include a country's overall economic activities. To assess the impact of economic development on green growth, we use GDP per capita. Similarly, we assess the

impact of economic expansion using annualised GDP growth. Both variables come from the World Development Indicators database (Tawiah et al., 2021).

Environment Indicator: This indicator reflects the factors which are non supportive towards environment. Carbon foot prints or carbon emission are the Based on life cycle assessments of numerous materials of important relevance to industrial industries, the capacity of carbon footprint to represent other types of impact, such as human toxicity, and thus the overall environmental impact, is studied .

Table 1

S.NO	COUNTRY
1	CHINA
2	JAPAN
3	INDIA
4	SOUTH KOREA
5	INDONESIA
6	SAUDI ARABIA
7	TAIWAN
8	THAILAND
9	UAE
10	ISRAEL

Sources: Author

Analysis of Data:

Fig 1 represent the year wise details GDP of each selected countries. Showing China is leading Asian country with highest GDP which is growing in from 2010 to 2020, follow by Japan and India. But Japan’s GDP is almost constant in past five years, while India GDP also growing but less in compare to India.

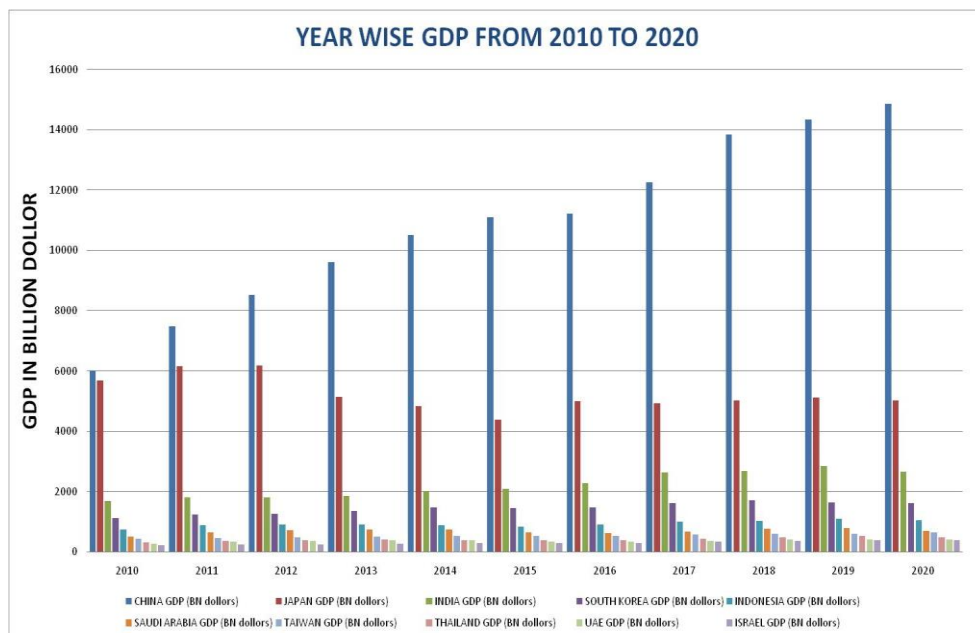


Figure 1

Below graph shows carbon emission by the countries. In figure 2, China's share among the all ten countries is highest. In second position India's also contributing in carbon emission. But, the green line shows constant in last 10 years, this result of Japan. Israel's contribution is minimum in this case.

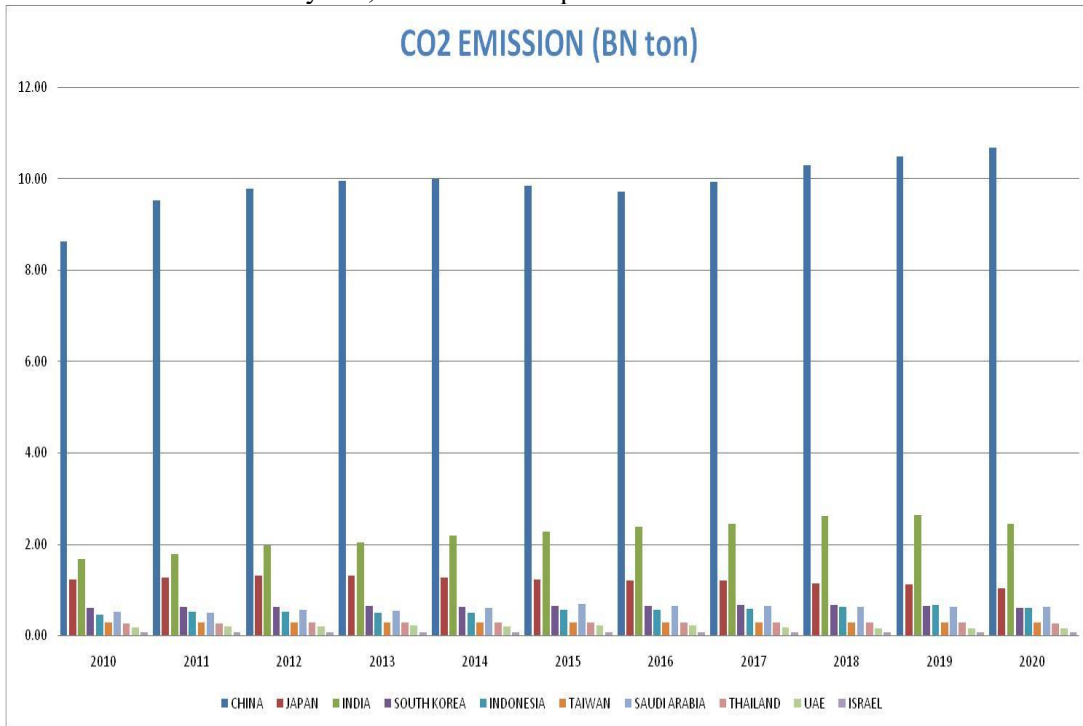


Figure 2

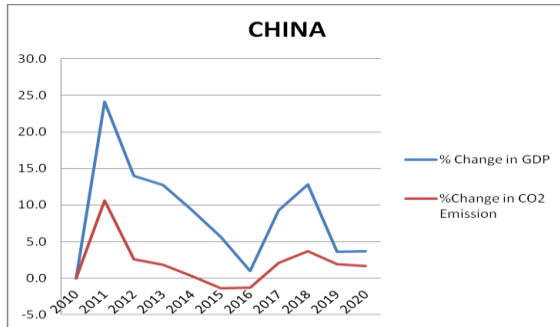


Figure 3

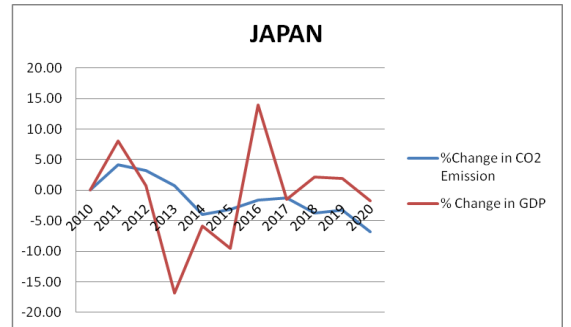


Figure 4

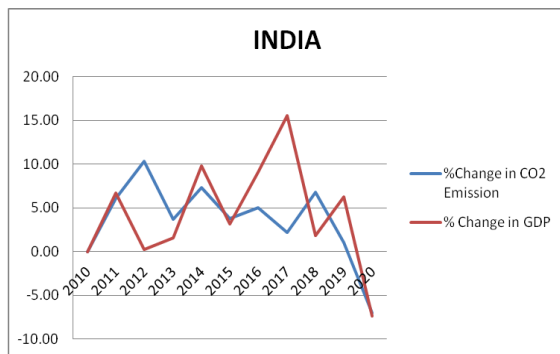


Figure 5

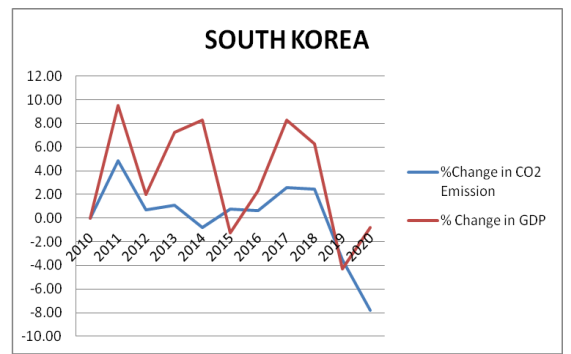


Figure 6

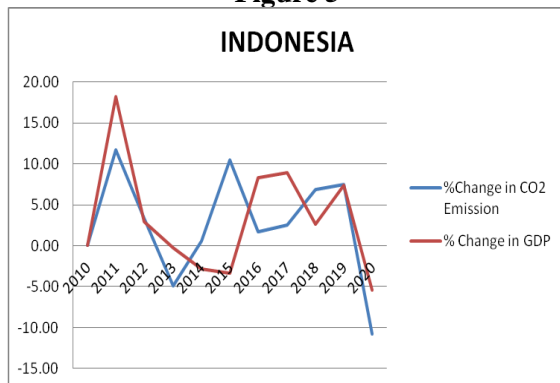


Figure 7

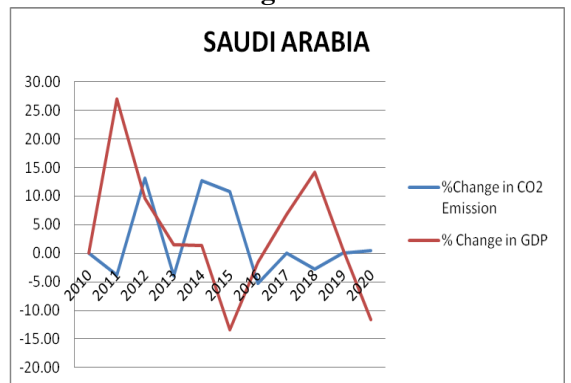


Figure 8

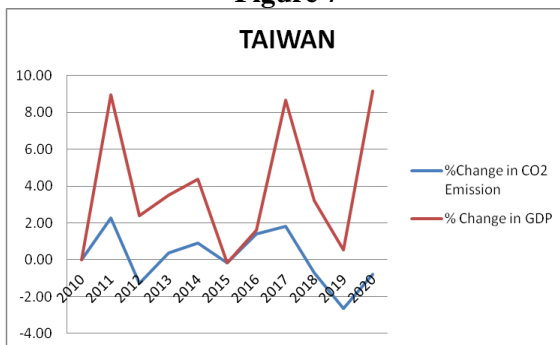


Figure 9

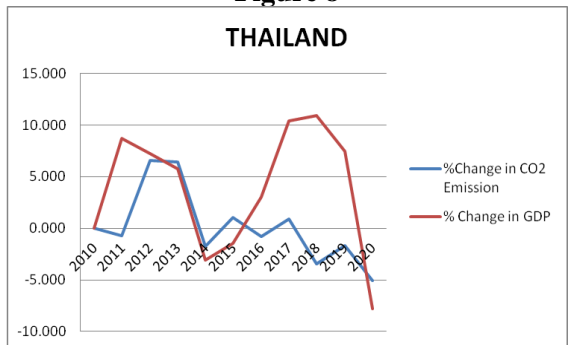


Figure 10

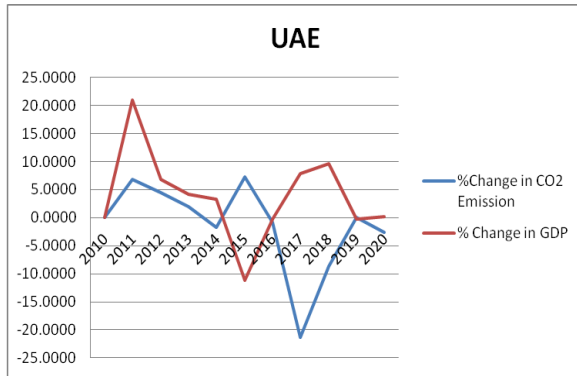


Figure 11

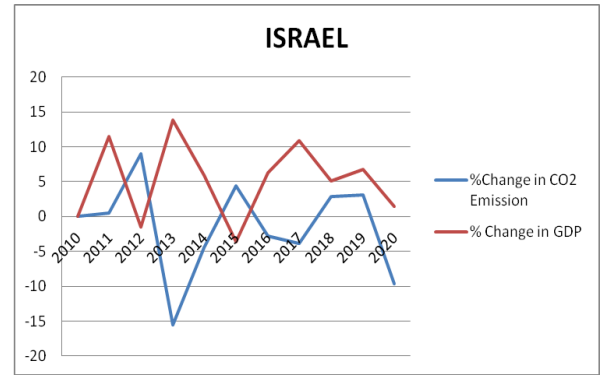


Figure 12
Table 2

NAME OF COUNTRY	CHINA		JAPAN		INDIA		SOUTH KOREA		INDONESIA		SAUDI ARABIA		TAIWAN		THAILAND		UAE		ISRAEL	
YEAR	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission	% Change in GDP	%Change in CO2 Emission
2010	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000	0.00	0
2011	24.2	10.58	8.02	4.12	6.71	6.09	9.54	4.86	18.18	11.69	27.05	-3.87	8.94	2.27	8.71	-0.702	21.01	6.8484	11.49	0.450798
2012	14.0	2.59	0.74	3.25	0.25	10.31	2.02	0.70	2.96	3.32	9.54	13.17	2.40	-1.28	7.21	6.567	6.80	4.4337	-1.54	9.023786
2013	12.7	1.81	-16.89	0.71	1.59	3.74	7.23	1.09	-0.26	-4.88	1.50	-3.97	3.49	0.38	5.73	6.412	4.16	1.9064	13.89	-15.5819
2014	9.3	0.33	-5.92	-3.92	9.82	7.31	8.28	-0.82	-2.79	0.58	1.39	12.65	4.37	0.92	-3.09	-1.721	3.34	-1.6862	5.94	-4.40326
2015	5.6	-1.37	-9.50	-3.19	3.16	3.78	-1.25	0.73	-3.40	10.52	-13.44	10.78	-0.15	-0.17	-1.49	1.075	-11.17	7.2581	-3.57	4.34633
2016	1.0	-1.30	13.99	-1.61	9.06	5.01	2.29	0.64	8.29	1.70	-1.58	-5.31	1.61	1.40	3.05	-0.789	-0.26	-0.8848	6.33	-2.78809
2017	9.2	2.06	-1.46	-1.30	15.58	2.17	8.25	2.58	8.95	2.56	6.85	0.05	8.67	1.83	10.40	0.891	7.82	-21.3519	10.85	-3.83202
2018	12.9	3.72	2.15	-3.76	1.87	6.82	6.30	2.42	2.68	6.90	14.16	-2.73	3.21	-0.69	10.93	-3.421	9.62	-8.6641	5.09	2.841451
2019	3.6	1.94	1.97	-3.28	6.27	1.01	-4.29	-3.51	7.42	7.43	0.78	0.07	0.52	-2.66	7.47	-1.648	-0.24	-0.0116	6.78	3.051451
2020	3.7	1.70	-1.77	-6.80	-7.32	-7.01	-0.80	-7.78	-5.39	-10.76	-11.64	0.50	9.18	-0.78	-7.81	-5.102	0.26	-2.5408	1.45	-9.68485

Comparative graphs represents the percentage change in GDP and Carbon Emission. In all figures, GDP and CO2 emission fallen in 2020 due global lockdown period. But in previous years ,China , India ,South Korea and Indonesia GDP has changes in positive direction with increased in carbon emission. In contact , Japan, Taiwan, Thailand, Saudi Arabia, UAE & Israel maintain their carbon emission.

CORRELATION ANALYSIS BETWEEN GDP AND CO2 EMISSION

Table 3

	GDP (BN dollors)	CO2 EMISSION (BN ton)	CHINA
GDP (BN dollors)	1		Strongly Positive correlation
CO2 EMISSION (BN ton)	0.901347228	1	

Table 4

	GDP (BN dollors)	CO2 EMISSION (BN ton)	JAPAN
GDP (BN dollors)	1		Weak Positive correlation
CO2 EMISSION (BN ton)	0.356980237	1	

Table 5

	GDP (BN dollors)	CO2 EMISSION (BN ton)	INDIA
GDP (BN dollors)	1		Strongly Positive correlation
CO2 EMISSION (BN ton)	0.938548272	1	

Table 6

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	SOUTH KOREA
GDP (BN dollors)	1		Moderatly Positive correlation
CO2 EMISSION (BN ton)	0.589985541	1	

Table 7

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	INDONESIA
GDP (BN dollors)	1		Strongly Positive correlation
CO2 EMISSION (BN ton)	0.914666485	1	

Table 8

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	SAUDI ARABIA
GDP (BN dollors)	1		Weak Positive correlation
CO2 EMISSION (BN ton)	0.266922676	1	

Table 9

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	TAIWAN
GDP (BN dollors)	1		Moderatly Positive correlation
CO2 EMISSION (BN ton)	0.421137146	1	

Table 10

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	THAILAND
GDP (BN dollors)	1		Weak Positive correlation
CO2 EMISSION (BN ton)	0.151315059	1	

Table 11

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	UAE
GDP (BN dollors)	1		Moderatly Negative correlation
CO2 EMISSION (BN ton)	-0.480078932	1	

Table 12

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	ISRAEL
GDP (BN dollors)	1		Strongly Negative correlation
CO2 EMISSION (BN ton)	-0.788062304	1	

Table 13

	<i>GDP (BN dollors)</i>	<i>CO2 EMISSION (BN ton)</i>	ASIA
GDP (BN dollors)	1		Strongly Positive correlation
CO2 EMISSION (BN ton)	0.913594455	1	

The above tables show the correlation between GDP and CO₂. China, India, Indonesia are highly correlated with .90 , .94 and .91 respectively. South Korea, Taiwan are moderate correlated with .59 and .48. Japan and Thailand data shows weak positive correlation between GDP and CO₂ which is .36 and .15. But USA and Israel shown negative correlation.

STRATEGIES ADOPTED BY ASIAN COUNTRIES FOR GREEN ECONOMY

In the above data it is clear that some countries doing has done a great work to reduce carbon emission and still working on that and some countries are working on it. Policymakers have an important role for the inception of green concept in an economy. Governments may help drive the shift to a more sustainable economy by including green economic principles into such choices (ACCA, 2012) . Brief studies of the strategies adopted by the selected countries are as follows.

China: By 2015, carbon intensity will have decreased by 17%, while energy intensity will have decreased by 16%; by 2020, carbon intensity will have decreased by 40–45% (Jacob et al., 2013). The Chinese government has used improved measures, such as legislative, policy, regulatory, and economic means, in dealing with environmental concerns in recent years, particularly during the 12th five-year plan era. China's national policies foster high levels of economic growth, transforming China into a "world factory" since its opening and reform, but at a heavy cost in terms of sustainable energy and ecological preservation (Steblyanskaya et al., 2021). The administration seeks to improve environmental public services and strengthen environmental risk prevention and control. "The central government will provide increased financial support, through measures such as general fiscal transfers and ecological compensation," according to the plan, "to improve environmental public services in western regions, areas prohibited or restricted for development, and other disadvantaged areas." Environmental public services should be guaranteed by local governments at all levels." The Plan proposes for environmental tax reform and a better waste disposal fee structure to help safeguard the environment. The government plans to create an environmental credit rating system for businesses, as well as a green rating system for banks and methods for designated funding for national ecological reparation. Environmental protection will necessitate an investment of roughly RMB 3.4 trillion (*Green Growth in Action_ China - OECD*, n.d.).

Japan : As per data Japan is one of the leading Patent filled country in Asia , having low carbon emission technology (Fankhauser et al., 2017). It is critical to decarbonize the power industry, which accounted for 37% of all CO₂ emissions in 2020. For this reason, renewable energy sources shall be utilised to the greatest extent possible. Electric power systems will be created to save money, and storage batteries will be used to handle output fluctuations while being environmentally friendly. As a result, as part of this expansion strategy, it is vital to promote offshore wind power and storage battery sectors. Through continued research and development, the technological seeds for realising these goals are already being uncovered. The Japanese government announced the Environment Innovation Strategy in January 2020, with the goal of developing innovative technologies to achieve the concept of "beyond zero" in terms of reducing CO₂ emissions that have accumulated in our atmosphere since the Industrial Revolution. In order to meet the challenges of the 2050 carbon neutral goals, significant economic development must be achieved through the transformation of industrial structure and economic processes. By stimulating private investment, the Green Growth Strategy is anticipated to generate jobs and growth by mobilising 240 trillion yen in cash and deposits locally and attracting the 3,000 trillion yen in funds available abroad for environment-related investment (Science & Policy, 2014).

India : In new agenda adopted in 2013 to achieves 17 sustainable development and 169 . By 2022, India aims to have a total installed RE capacity of 175 GW, with 100 GW coming from solar, 60 GW from wind, 10 GW from small hydro, and 5 GW from biomass-based power projects. Grid security necessitates renewable energy projections. .

1. To choose a more environmentally friendlier and cleaner road than others have taken in the past, with the same degree of economic progress.
2. Reduce the carbon intensity of its GDP by 33–35 percent from 2005 levels by 2030.
3. By 2030, non-fossil fuel-based energy resources will account for around 40% of total installed capacity, with the support of technology transfer and low-cost foreign investment, notably from the Green Climate Fund (GCF).
4. To produce a 2.5–3 billion extra carbon sink tonnes of CO2 equivalent through forest expansion by 2030, there will be more trees than people.
5. Improve climate change adaptation through increasing expenditures in development programmes in climate-vulnerable sectors, such as agriculture, water resources, the Himalayan area, coastal regions, health, and disaster management.
6. Given the resources necessary and the resource gap, mobilise local and new and additional money from developed nations to conduct the following mitigation and adaptation initiatives.
7. To establish capacities, as well as a local and international framework for the rapid dissemination of cutting-edge climate technology in India, as well as cooperative collaborative research and development for such future technologies .

(GGGI & TERI, 2015)

South Korea : Unlike the European Green Deal and the United States' Green New Deal, South Korea's Green New Deal evolved as a direct response to the COVID-19 epidemic. Three key topics and eight particular implementations are identified in the Korean Green New Deal. The government anticipates a total investment of 73.4 trillion KRW (42.7 trillion KRW from the Treasury) and the creation of 659,000 employment. Funding for Green New Deal initiatives is likely to come from both public and private sources. The government will install solar electricity for public rental housing (225,000 units), childcare centres, health centres, and medical institutions over a 15-year period, as well as replace high-performance insulating materials. National and public childcare facilities (440) and national sports centres (51) will be rebuilt using high-efficiency energy equipment and environmentally friendly materials. Cultural establishments, such as museums and libraries, will receive energy-saving equipment, such as solar power systems and LED lighting (1148 sites), and energy efficiency will be encouraged in government buildings. (Lee & Woo, 2020).

Table 14

Area	Tasks	Budget (trillion KRW) (by 2022)	Budget (trillion KRW) (by 2025)	Jobs (thousand)
	Total	19.6	42.7	659
	Subtotal	6.1	12.1	387
Green Transition of Infrastructures	Turning public facilities into zero-energy buildings	2.6	6.2	243
	Restoring the terrestrial, marine, and urban ecosystems	1.2	2.5	105
	Building a management system for clean and safe water	2.3	3.4	39
	Subtotal	10.3	24.3	209
Low-Carbon and Decentralized Energy Supply	Building a smart grid for more efficient energy management	1.1	2.0	20
	Promoting renewable energy use and supporting a fair transition	3.6	9.2	38
	Expanding the supply of electric and hydrogen vehicles	5.6	13.1	151
	Subtotal	3.2	6.3	63
Innovation in the Green Industry	Promoting prospective businesses to lead the green industry, and establishing low-carbon and green industrial complexes	2.0	3.6	47
	Laying the foundation for green innovation via the research and development (R&D) and financial sectors	1.2	2.7	16

Source: Sustainability , MPDI

Indonesia :

The country's GDP per capita steadily rose from \$857 in 2000 to \$3,847 in 2017.¹ In 2018, Indonesia is the world's 10th largest economy in terms of purchasing power parity and a member of the G-20 (*Indonesia's transition to a green economy*-, n.d.).

Improve disclosure of information about industrial environmental performance (e.g. on emissions of air pollutants, wastewater effluent collected through PROPER) and, in the medium term, work towards offsetting up a pollutant release and transfer register. Enhance incentives for investment in waste, water and sanitation by gradually increasing user fees to make service providers more independent, commercially and financially robust and capable of funding capital investment. Continue to build capacity among financial institutions to comply with the sustainable finance regulation and to improve their contributions to financing of climate and green economy-related projects. Explore options on how the regulation could be used to promote compliance with environmental law (*Indonesia's transition to a green economy*-, n.d.).

Saudi Arabia : Saudi Arabia, the world's largest oil exporter, has long been linked with anti-environmental practises. For decades, its oil exports have fueled global economic development. It exported 13.3% of the world's total oil in 2019, but this has also meant it has contributed significantly to global warming. Saudi Arabia is one of the world's worst CO₂ emitters per capita due to its massive domestic oil consumption (*Saudi Arabia's Environmental Sustainability Strategy - Asia House*, n.d.). Climate Action Tracker has deemed Saudi Arabia's Nationally Determined Contribution (NDC) under the Paris Agreement to prevent 130 million tonnes of CO₂ emissions as woefully insufficient to address global climate change. Saudi Arabia has expanded investment and government resources to put the Kingdom on a more ecologically sustainable footing with the implementation of 'Vision 2030' five years ago.

The key drivers behind Saudi Arabia's moves towards greater environmental sustainability are:

1. Global oil demand will eventually decrease: Recent McKinsey report argues that the demand shock caused by COVID-19 could bring forward peak oil demand to 2029. Technological advances in electric vehicles and battery storage, and declining renewable energy costs, could put further downward pressure on oil demand.
2. Although global oil demand will eventually decrease, it remains a key input for producing petrochemicals and jet fuels, and alternative hydrogen-based fuels such as "blue" ammonia. Saudi Arabia produces oil more cost-effectively than any other country at around US\$2.80 per barrel.
3. Saudi Arabia aims to have renewables make up 50 per cent of its energy production by 2030. This ambitious target was reaffirmed in March 2021 when Crown Prince Mohammed bin Salman launched the Saudi Green Initiative.
4. Vision 2030 target for renewable energy production from 9.5GW to 57.8GW by 2030. Saudi Arabia's first utility-scale solar power project, the 300MW Sakaka plant, became operational in April 2021.– Saudi Arabia's first utility-scale wind farm, the 400MW Dumat Al Jandal wind farm, is reportedly half-way near completion. In 2019, the US\$28 billion Saudi Industrial Development Fund announced it would invest in renewable energy projects and in 2020 the government announced it would invest US\$30 billion in renewables by 2025.

Taiwan : Taiwan's EPS has gradually improved, there is still a lot of room for improvement when compared to OECD member states, and there should be the establishment of a green economy system in accordance with the laws. In particular, while we can see that emission levels for thermal power plants have greatly improved in terms of the non-market based policies, from the perspective of the overall energy transition, non-market indicators such as investment in renewable energy R&D, or tariff feed-in pricing for wind and solar power, as well as ratio of renewable energy, promotion of energy efficiency, Taiwan clearly lacks motivation and delays to action compared with OECD member states. This will be the greatest challenge to Taiwan's transition to a green economy in the coming days. In terms of reforms

A Journal for New Zealand Herpetology

to the market-based policy, this paper recommends the following reforms: setting out legislature on energy tax to force high pollution and high energy consumption industries to bring about energy transition, actively promoting renewable energy diversity and energy democratization to improve the overall percentage of electricity generation that renewable energy accounts for, the stipulation of auxiliary regulations of the Greenhouse Gas Reduction and Management Act to implement a carbon trading scheme (Lin & Chou, 2018).

Thailand: Thailand is extremely vulnerable to climate change, which manifests itself in the form of water shortages, droughts and floods. The country is also a growing contributor to global climate change, ranked 18th in total greenhouse gas (GHG) emissions in 20123, which is nearly triple its 1990 levels. Thailand's energy-intensive industrial sector is a significant contributor to its GHG emissions, powered by 49% petroleum and oil products. This translates into reduced energy security and high air pollution, as well as net economic loss of roughly USD 900 million to the Thai economy. Thailand's net GHG emissions in 2011, taking into account the net carbon sequestration from land use, land-use change and forestry, were 234.58 MtCO_{2e}. The energy sector was the largest contributor, accounting for 222.94 MtCO_{2e} or 73% of total emissions. The second largest contributor was agriculture (53 MtCO_{2e}, 17.3%), followed by industrial processes (18 MtCO_{2e}, 6%), and waste (11.4 MtCO_{2e}, 3.7%). Green Growth and Sustainability strategy aims to accelerate natural resources and environmental conservation and rehabilitation processes. It aims to increase forest cover to 40% of total land area, and ensure appropriate municipal solid waste management in 75% of the targeted areas by the end of the 12th NESDP period. The strategy also aims to reduce GHG emissions by 7-20% by 2020, compared to the business as usual (BAU) projection. In addition, the strategy aims to increase climate resilience and adaptation capacity (Global Green Growth Institute, 2017).

United Arab Emirates : By virtue of Vision 2021, the UAE is striving to diversify its income resources by moving away from oil. In January 2012, Sheikh Mohammed launched the Green Economy initiative under the slogan: A green economy for sustainable development. Under this initiative, the UAE seeks to become a global hub and a successful model of the new green economy, to enhance the country's competitiveness and sustainability and preserve its environment for future generations. The initiative includes a range of programmes and policies in the areas of energy, agriculture, investment and sustainable transport in addition to new environmental and constructional policies.

1. The first field of green energy aims to promote the production and use of renewable energy.
2. The second field includes government policies aimed to encourage investments in green economy and to facilitate the production, import, export and re-export of green products and technologies.
3. The third field relates to developing urban planning policies that preserve the environment and to raise the efficiency of housing and buildings environmentally.
4. The fourth field consists of means for dealing with the effects of climate change, promote organic agriculture, maintain biodiversity and protect the ecological balance.
5. The fifth field aims at rationalizing the use of water resources, electricity and natural resources and recycle waste.
6. The sixth field includes development and promotion of green technology.

(Green Economy for Sustainable Development - The Official Portal of the UAE Government, n.d.)

Israel: The country profiles confirm that eco-innovation policies deploy a variety of instruments. In most non-EU OECD countries, public research and development (R&D) remains a major orientation. The United States and Japan typically allocate significant public finance to environment-related R&D. However, three trends have emerged: i) some countries are concerned by the competition and trade issues related to such support; ii) public resources are increasingly channelled via Departments not directly in charge of environment policies (Energy, Agriculture, Transport), making inter-agency cooperation even more necessary; iii) the role of research organisations is being redefined, to intensify

linkages with the private sector and stimulate the development of marketable outputs. In August 2008 the Government has initiated a 5 year plan for the promotion or the renewable energies sector.

Encouragement of industrial research – Using various channels, the plan funds academic studies and research in the field, funding of other research institutions and academic conferences. A total amount of NIS 50 million (USD 14 million) will be allocated from several ministries.

Encouragement of applied research and development -

Ministry of Agriculture and Rural Development) particularly for renewable energy research in a total amount of NIS 35 million (USD 10 million); a new development center will be established in the Negev that will support R&D initiatives in a total budget of NIS 57 million (USD 16.3 million). In November 2010, the Israeli Government approved a national plan for reducing GHG emissions in Israel in order to achieve a 20% reduction of total GHG emissions in 2020, compared to a BAU scenario. During this period, the different ministries will allocate a total amount of NIS 2.2 billion (USD 600 million) in order to reach this objective. The Ministry of National Infrastructures received a budget of NIS 269 million (USD 74 million) to reduce household energy consumption. In January 2009, a general goal was set by the Israeli Government to reach a 5% share in electricity production from renewable energy sources by 2014 and a 10% share by 2020. While taking into consideration the energy efficiency steps being carried out simultaneously the goal for electricity generation from renewable energy sources by 2020 is 6.43 terra-watts per hour (TWH).(OECD, 2011)

	Dec. 2014	2016-2017	2018-2019	2020	% of total production
Wind (TWH)	0.61	0.98	1.47	1.96	30.04
Biomass (TWH)	0.33	0.66	1.05	1.38	21.1
Large thermo solar and photovoltaic (TWH)	1.33	1.43	1.90	2.28	34.87
Medium photovoltaic (TWH)	0.60	0.60	0.60	0.60	9.1
Photovoltaic up to 50KW (TWH)	0.32	0.32	0.32	0.32	4.89
Total production in practice (TWH)	3.19	3.99	5.34	6.54	100%

Souces:OECD.

Conclusion:

Growth and development is important for all countries. Due to availability of various resources Asian countries are developing to meet demand. With development and growing industries, carbon di oxide and other gases emits. The emission causes depleting the ozone layer and also increases green house effect. Earth’s temperatures increase to 1 degree to 1.5 degree over a period of 100 years. Temperature of oceans also increases and their level is rises. These are enough causes for worry, government of nations around the globe has now understood that if they not able to control the pollution occur from industrialisation, mankind will abolish. Therefore, several steps has been taken to find out the solution for sustainable growth. In this paper, studied that China, India, Indonesia are given more emphasis to industrial growth as result their carbon emission also growing with positive and high correlation. Japan, Thailand, Taiwan, Korea are working to reduce the pollution. Most attractive result shown by Israel, Saudi Arabia , and UAE , result of the correlation between GDP and CO2 is least or negative , this shows these countries are developing the industrialisation in a control environment.

Countries are follows the concept of green economy and sustainable growth. Adoption of new industrialisation policy by taking care of environment is a primary objective. Saudi Arabia is using ‘blue ammonia’ as a fuel which release low pollution. China, Japan, India, is trying to reduce their pollution. Israel doing it for a decade and now as per the data it is clear that they makeover the changes by their policy and implementation toward green economy.

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