

Comparison between Norwegian and Indian Policies towards the Adoption of Electric Cars- Why India is Lagging Behind?

A. K. Agarwal^a, Shantam Babbar^{b*}

^{a&b}Department of Commerce and Business Administration, Meerut College, Meerut, U.P., India
E-mail: ashokkagarwal64@gmail.com^a, babbarshantam@gmail.com^b

Abstract

World is facing many environmental problems due to increasing CO₂ emission. Many policies are being developed globally and almost every country is building up their own strategies for sustainable development to ensure a net-zero emission in the upcoming decades. A new trend emerging among all economies to adopt the use of EVs and to minimise the vehicular emission using renewable sources of electricity generation. Norway has the largest share of EVs in the world. This paper compares various strategies implemented by the Norwegian government to reach this level so far with the Indian policies being adopted in the country to leap towards the electrification of cars.

Key Words: Battery Electric Vehicle, Hydrogen Fuel Cell, Internal Combustion Engine, Electric Vehicle Charging Station, Air Quality Index, Below Poverty Line.

PAPER/ARTICLE INFO

RECEIVED ON: 16/04/2022

ACCEPTED ON: 19/05/2022

Reference to this paper should be made as follows:

Agarwal, A.K. & Babbar, Shantam (2022), "Comparison Between Norwegian and Indian Policies Towards the Adoption of Electric Cars- Why India is Lagging Behind?", *Int. J. of Trade and Commerce-IIARTC*, Vol. 11, No. 1, pp: 142-157

*Corresponding Author

DOI: 10.46333/ijtc/11/1/15

1. INTRODUCTION

The world is facing adverse impacts due to climate change. Every economy has a challenging situation to tackle with emission of greenhouse gases. Many efforts are being taken across the world to overcome this situation to maintain sustainability goals such as the Paris Agreement, Responsible Business Conduct, Technological Advances, Sustainable Development Goals, etc. The Paris Agreement, 2015 affirms a strong commitment to achieve a crucial decline in emissions with a target of reaching zero-emission in the coming decades the target varies from country to country. Presently, all the member countries have agreed upon to hold the rising temperature to less than 2°C on an average based on pre-industrial levels limiting it to somewhere around 1.5°C. Different countries have developed their action plans keeping in mind the opportunities and challenges faced by them.

Electrification of Vehicles has become an integral part of the policy measures being adopted by almost all the countries. Almost every country has developed and adopted certain strategic measures to shift towards e-mobility in their economies. The use of BEVs encounters a lot of challenges such as lack of charging infrastructure, high battery cost, lower level of income in some countries, range anxiety, consumer awareness, utilisation of renewable energy, etc.

According to (iea.org, 2021), the electric cars running on the roads in the year 2021 exceeded 10 million globally. The growth is tremendous despite of the crisis of Covid-19 pandemic all over the world. The global sales of electric cars saw a 70% rise in aggregate making a record share of 4.6% of the total global car sales in 2020. In the year 2020, electric car registrations globally reached to about 3 million units which represent a positive sign for its growth worldwide. The share of BEVs in Norway is one of the highest in the world, ranging to more than 70% of the new car registration in the year 2020.

Electric car's king Norway implemented various significant fiscal incentives for EV adoption in 1990s for the first time in the world. Various other nations also followed strategies similar to that of Norway by adopting and applying the like measures at a later stage. Today almost every company associated with car industry is working hard to bring in inventions relating to 'e-mobility' with the latest technology to boost the IoT (Internet of Things) technology making the cars a 'connected machine'.

The Norwegian Parliament recently announced its national goal of achieving the target of Net Zero-emission from the new cars to be sold by 2025 in their country. The country is working on the technology of BEVs and HFCs. In the year 2020, the share of BEVs held to be 54% of the total market share which is a far more than other countries. The EFTA Surveillance Authority (ESA) has exempted the levy of VAT on the sale of zero-emission vehicles in Norway until the end of the year 2022. Many other financial as well as non-financial incentives are being offered throughout the country as per the drafted national policy measures. According to (EVANNEX, 2021), Norway is known to be the most charged country on the planet. The share of BEVs reached more than 70% of the total vehicles in the market. If we add up the hybrid and plug-in-hybrid vehicles, the share reaches up to 92% of the entire vehicle fleet.

The Government of India has also pulled up its sleeves to combat the problem of increasing temperature and frequent climate change situations. According to (Express Drives Desk, 2021), As far as automobile sector is concerned, the government has laid down policies to achieve its target

of achieving the sales of at least 70% of all commercial vehicles, 30% of private cars, 40% of the Buses and 80% of the two-wheeler and three-wheelers as zero-emission vehicles by 2030.

(Vishnoi, 2021) Bhupender Yadav, the minister for Environment and Climate Change, announced on 25th November, 2021 that India will reach the level of Net-zero emission by the year 2070. This initiative has been undertaken after he attended the stocktaking plenary session at the COP26 U.N. Climate Summit in Glasgow, Scotland on 13th November, 2021 as representative of India. The minister in his speech directed the attention towards environment changes in terms of prolonged heat waves, cyclones, draughts etc. and urged that there is no need to predict the future, it is here. If we are not taking any steps now than it will be too late.

(iea.org, 2021)The total global consumer spending on purchase of electric cars in the year 2020 saw an increase of about 50% from 2019 reaching to USD 120 Billion. However, the governments of almost all the countries are providing various lucrative incentives, whether financial or non-financial, according to the needs of their nations to the people to switch towards the e-mobility. Also,(iea.org, 2021)stated that in 2020, the cost incurred by the governments worldwide to promote the sale of EVs in their countries reached a collective figure of USD 14 billion.

Different nations are actively working on policy formulation which suits best to their economic conditions and welfare of the customers in adoption of the EVs. However, it will be a long-term process which might see many pros and cons ahead.

There were about 370 different models of electric cars available across the world in 2020(iea.org, 2021). Among all the nations today, China being the potential hub of electric cars manufacturing and market offers the widest range of electric car models to its customers to choose from.

As per (Wappelhorst, 2021)More than 20 nations have shown their intention to phase-out the traditional ICE engines completely form their economies in the coming years. Moreover, there is a strong commitment to achieve the net-zero emission in the coming decades by more than 120 countries having a share of around 85% of the on-road global vehicle fleet (iea.org, 2021).

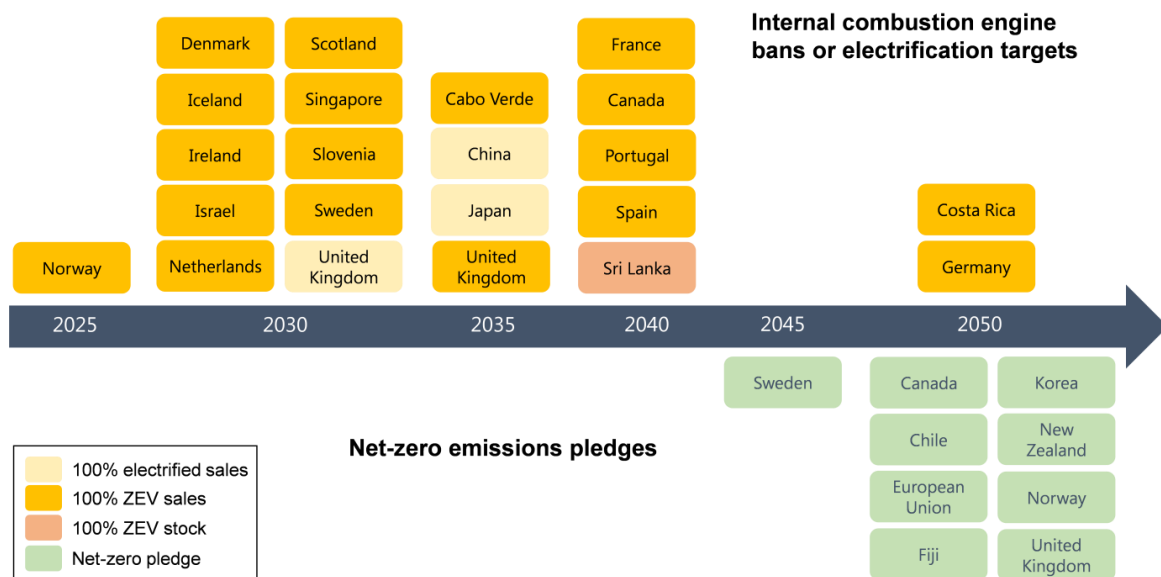


Figure showing the commitments of various nations regarding banning of ICEs and Net-zero Emissions Pledges. SOURCE: (IEA.ORG, 2021)

2. REVIEW OF LITERATURE

(Bjerkan, Nørbech, & Nordtømme, 2016) This study described various incentives being offered by Norwegian Government for promoting the adoption of BEVs. The significant incentives which influence the decision of buyers have been evaluated that act as important factors while making purchase decision. Some of them are Reduced Fixed Costs, Reduced Use Cost, Priority to infrastructure. The study focuses on various mechanisms that acted as beneficial for the promotion of BEVs in Norway.

(Stephens, Zhou, Burnham, Wang, & Laboratory, 2018) This study has laid down various policies and initiative undertaken by the governments of U.S., Europe and China. It has observed the regional policies of these places. In the study various monetary, non-monetary and other local benefits that have benefitted the EV industry are discussed in an organised form. A brief comparison of the different policies is also discussed in a general form and a conclusion of the policies have been drawn and most effective ways have been discussed with due references of the relevant facts.

(Sun, et al., 2020) The pivot of this study is on the policies adopted by various countries formed to achieve the clean energy generation. Also, it compares them with each other to arrive at meaningful comparison. It suggested that there is a need to establish coordination from various levels of governments and electric power companies to ensure effectiveness of energy policies worldwide. The observations of this study indicate a need for comparison and comprehensive review which are necessary and may help researchers and practitioners to understand clean energy policy determination, promotion, and implementation.

(Kesari, Sharma, & Goel, 2019) This study discusses the present scenario of government policies which are implemented in India. The various challenges have been highlighted and the future prospect relating to EVs have been discussed based on relevant facts. Study provides a brief comparison between ICE, hybrid and EVs. The authors have also discussed the policies of various countries having significant share of EVs to get an overview of the EV industry across the world. Author suggested that public procurement is significant for the growth of EVs in future. Electric four wheelers are expected to reach new heights in next five to six years when batteries will become cheaper and more charging points would be available in the country.

(Rokadiya, Yang, & Bandivadekar, 2019) The study presented regulatory overview of global regulations regarding fuel economy taking United States, European Union, China and India into consideration. The study discussed that all major global markets offer incentives in the form of super-credit multipliers, with the value of super-credit multipliers being much higher in China and India in comparison to the European Union and the United States. Super-credit multipliers can dilute CO₂ standards significantly and are associated with significant environmental costs. On the emissions accounting side, excepting India, all major markets allow EVs to be treated as zero-emission vehicles for compliance purposes but as far as India is concerned, India does not treat EVs as zero-emission vehicles and consider them to be consuming gasoline equal to conventional vehicles ultimately emitting pollution.

(Mishra & Malhotra, 2019) This study is relevant for car manufacturers and policymaker to highlight the environmental benefits of e-Mobility and exhibit how EVs could play a part in combating air pollution. It stated that social influence and financial advantages are directly associated with purchase intention of the potential customers. The authors suggested that people are not aware of financial benefits that EVs can provide as the technology is still in its nascent stage in India. If the Government of India wants to boost the sales of EVs, then it has to play critical role and effectively implement its policies so that it could play a leading role in adoption of EVs. Reliance on social influence may not work in collectivist society like India.

(Chaturvedi & Malyan, 2021) The study provides an analysis of alternative breakthrough technologies for India's net-zero future and the major challenges that India is facing to tackle with the emissions. According to the study, commercial availability of both CCS and hydrogen is expected to have important implications. The authors suggested that coal is the most important energy resource that needs to be managed in India for generation of electricity to reach the goal of zero-emission. This study presents the nature, pace, and magnitude of energy sector transition that would be required for alternative peaking and net-zero-year targets. The authors concluded that the shift from present scenario to achieve the future target of net - zero emission would be much faster due to favourable attitude of the society.

(Agrawal & Rajapatel, 2020) This study suggests that economic incentives motivate people to buy EVs especially as long as the prices of EVs are higher than ICE vehicles. Consumer confidence is being enhanced through the building up of the charging stations at prime locations of the cities and highways. The government also need to develop policies regarding the issues relating to supply of raw material used to produce EVs. The government must increase policy support to promote the battery industry so that the investment risk shall be minimised which may bring a growth in the production of battery packs at reduced cost in future.

(Parulekar, et al., 2017) According to this study, the charging infrastructure for EVs and its regular maintenance is still in its preliminary stage in India and various private institution have come up with their plans to provide various charging facilities across the nation. The EVs are going to have a great future in Indian market with various supporting policy measures taken by the government.

3. RESEARCH PROBLEM

The marketing of EVs has become a latest trend worldwide. Almost all the governments are framing up their policies to adopt the EVs in their countries to tackle with the situation of air pollution. The concept is new and has a lot of opportunities for businesses as well. Despite the fact of lower emission norms, India can welcome this as a great business opportunity for manufacturing and development of its market for EVs in almost every part of the world. Under this paper, we are comparing the existing king's policies (Norway) along with some other factors influencing the EV market with that of India in order to develop the understanding of major reasons for the difference between the two countries and the possible ways which can be adopted in Indian economy through which India can also expand its market for electric cars.

4. RESEARCH METHODOLOGY

This study is based on secondary data collected from various sources based on the electric cars in both Norway and India. The data so collected has been analysed and compared to develop meaningful conclusions. Both countries have different environments, resources, market conditions, level of education, income, technological advancements and infrastructure. The results of the study suggest various potential activities that can be adopted in India to increase its market for electric cars taking Norwegian policies as the basis for comparison.

5. COMPARISON POINTS

BASIS	NORWAY	INDIA
Area	323,802 Sq. km. being the 69 th largest country of the world having land area of 0.2% (approx.) of total world's landmass. (worldometers, 2020)	3,287,590 Sq. km. being the 7 th largest country of the world having land area of 2% (approx.) of total world's landmass. (worldometers, 2020)
Population	5,421,242 as of 2020 (IQAir, 2019)	1,380,004,385 as of 2020 (IQAir, 2019)
Human Development Index	0.957 being First in the ranking of 189 countries of the world.(United Nations Development Programme, 2020)	0.645 being at 131 in the ranking of 189 countries of the world. (United Nations Development Programme, 2020)
Employment Rate	Overall rate of employment accounted to 67.2% in 2020 in which 2.85 million people were employed in the country.(Statista Research Department, 2021)	Overall rate of employment accounted to 42.4% in the fourth quarter of 2020. (Trading Economics, 2021)
Unemployment	Unemployment rate for 2020 accounted to 4.62% in the country. (macrotrends, 2020)	Unemployment rate for 2020 accounted to 7.11% in the country (Trading Economics, 2021).
Poverty	Due to lack of relevant data, it has not been calculated for this country. (UNDP, 2020)	7.7%of the employed population is living BPL and earning less than \$1.9 PPP a day as of 2019.(Trading Economics, 2021)
Per Capita Income	\$67,389.9 for 2020 (The World Bank, 2020)	\$1,900.7 for 2020 (The World Bank, 2020)
GDP	Norway's GDP for 2020 amounted to \$362.01 billion (Macrotrends, 2020)	India's GDP for 2020 amounted to \$2622.98 billion (Trading Economics, 2020)
GNI Per Capita PPP\$	Current international \$66,020 for the year 2019. (The World Bank, 2020)	Current international \$6,390 for the year 2020. (The World Bank, 2020)

National Income	As per the report of World Bank Norway earned 35,517.16 crores PPP dollars in 2020.	As per the report of World Bank India earned 8.82 lakh crore PPP dollars in 2020.
Average Finance (Lending) Rate	Average lending rate in the country for financing a car range approximately 4.44 % p.a. effective with a condition of 35% own capital of the borrower. (DNB Bank, 2021)	Average lending rate in the country for financing a car range approximately 7.55% p.a. to 8.25% p.a. as per State Bank of India. (Bank Bazaar, 2021)
Annual Registrations (In Numbers)	Total cars registered were 1,41,400 of which more than 76,000 are battery EVs for the year 2020 as per Statista report.	Only 5,905 electric cars were registered in India during the financial year 2021. (Dalvi, 2021)
Environment Pollution Ratings (AQI)	Norway is one among the cleanest countries of the world. It ranked 101 of 106 countries in terms of pollution in the year 2020. The average AQI for the same period was 24 which is a good sign. (IQAir, 2019)	India is the 3rd largest polluter in the world. Average AQI for the year 2020 was 51.90 . Air in some of the cities is not fit for human intake. (IQAir, 2019)
CO2 Emission	Being one among the cleanest countries, Norway emits a mere 0.1% of global CO ₂ . One third of its fraction is generated from transportation sector. (Cloete, 2021)	(Narain, 2021) India is ranked third highest polluter in the world in 2019, CO ₂ emission in the country amounted to 2.88 CO₂ giga tonnes (Gt) as compared to the highest polluter (China at 10.6 Gt) and second highest (United States at 5 Gt). Transportation sector alone accounted to 277 Metric Tonnes of CO ₂ for the year. (knoema, 2020)
Electricity Generation	Methods of Electricity Generation in Norway is very clean. The electricity is generated as below (as per 2019 figures): (Statista, 2019) 93.4% Hydro Power 4.1% Wind Power 2.5% Thermal Power.	Electricity generation in India involves the use of non-renewable resources on a large scale which leads to a lot of pollution. The electricity is generated as follows (as per 2019 figures): (Central Electricity Authority, n.d.) 63.0% Coal and Gas 12.5% Hydro Power 22.7% Renewable sources 1.9% Nuclear Power

5.1 No. of Charging Stations

i. Norway

According to Statista report, the various number of charging points of different types located at different places in Norway are listed below:- (Statista, 2020)

Charger	Number of Points
▪ Standard	11450
▪ Chademo 50 kW	1757
▪ CCS 50 kW	2021
▪ Tesla Supercharger	848

ii. India

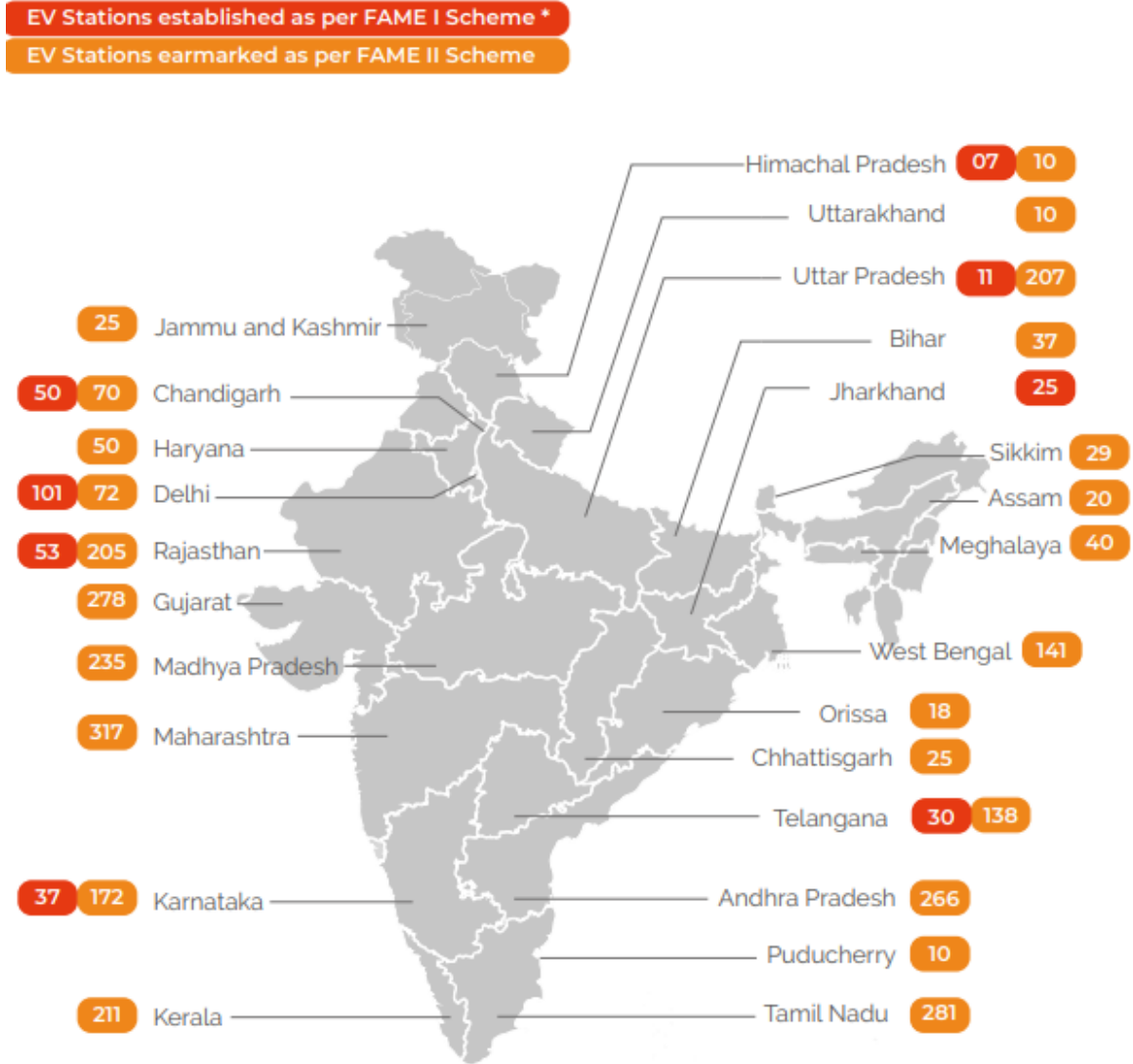
(The Economic Times, 2021) According to HT Auto e-paper, The Government of India aims to set up at least 22,000 EV charging stations, using the facility of 70,000 petrol pumps across the country. The minister of Heavy Industries, Mahendra Nath Pandey, stated its planning to establish EVCSs at expressways, highways and populated cities in the initial phase.

According to (Ministry of Power, 2021) POWERGRID EV charging stations (EVCS) are operating with DC-0001 (15 kW) fast chargers to facilitate the quick adoption of EVs. The chargers work on smart technology and are self-sufficient to meet up the goals. Further, implementation of multi-modal charging station with CCS II, Bharat DC 001, CHAdeMO etc. are also under implementation and would cater each and every e-car plying in the country.

Government policies aim to setup charging station at a minimum distance of every 25 kms on both the sides of a highway whereas it shall be at every 100 kms for the long range and heavy-duty EVs used for transportation. As far as the cities are concerned, the government plans to establish a charging station at every 3 kms inside the city area.

As of 15th March 2021, DHI has sanctioned 3397 EVCS under Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) Scheme.

Charging stations established under FAME schemes



*Delhi-Chandigarh Highway: 16 ; Mumbai-Pune Highway: 15; Jaipur-Delhi-Agra: 29; Goa: 6

Source: Department of Heavy Industry, JMK Research

Figure showing charging stations established in India under FAME scheme
SOURCE: Department of Heavy Industry, JMK Research

5.2 Government Incentives

i. Norway

Success story of the Norway depends mainly on the steps taken by its government from time to time. Now the Norwegian Parliament has set up its national goal of selling only EVs and HFCs by 2025. The various incentives (Norsk elbilforening, 2021) that have been taken by the country from time to time are mentioned in the following points:

- No purchase/import taxes (1990-).
- Exemption from VAT on purchase (2001-).
- Exemption from annual road tax (1996-2021). Reduced tax from 2021.
- Zero toll charges (1997- 2017).
- Maximum charge to be 50% on ferry fares for EVs (2018-).
- Maximum charge to be 50% on toll roads (2019).
- Zero charge on municipal parking (1999- 2017).
- Maximum parking fee for EVs to be 50% of the full price (2018-).
- Free access to bus lanes (2005-).
- New rules allow local authorities to limit the access to only include EVs that carry one or more passengers (2016).
- 50 % reduction on car tax for companies (2000-2018).
- Car tax reduced to 40% for companies (2018-).
- Leasing agreements to be Exempt from VAT (2015).
- Fiscal compensation at the time of conversion of fossil vans into zero-emission vehicle (2018).

ii. India

Indian market for EVs is in its infancy. The share of electric cars accounts nearly to 1% of the total in the economy. The country has a huge potential for the expansion of EVs market. Presently the following incentives are being provided by the government in the electric cars (Cardekho, 2021):

- INR 10,000 per kWh of the battery capacity, upto a maximum incentive of INR 1,50,000 is provided by the government of India as a subsidy to buy electric car in the country under the Faster Adoption and Manufacturing of Hybrid and EVs (FAME-II) scheme (2019-).
- Exemption from the payment of registration fee on EVs.
- Removal of Road tax on purchase of EVs.
- Reduced rate of GST to 5% on EVs across the country. The charge was 12% earlier.
- Tax benefit up to INR 1,50,000 under section 80EEB of the Income Tax, 1961 for the first-time buyers of the EVs.

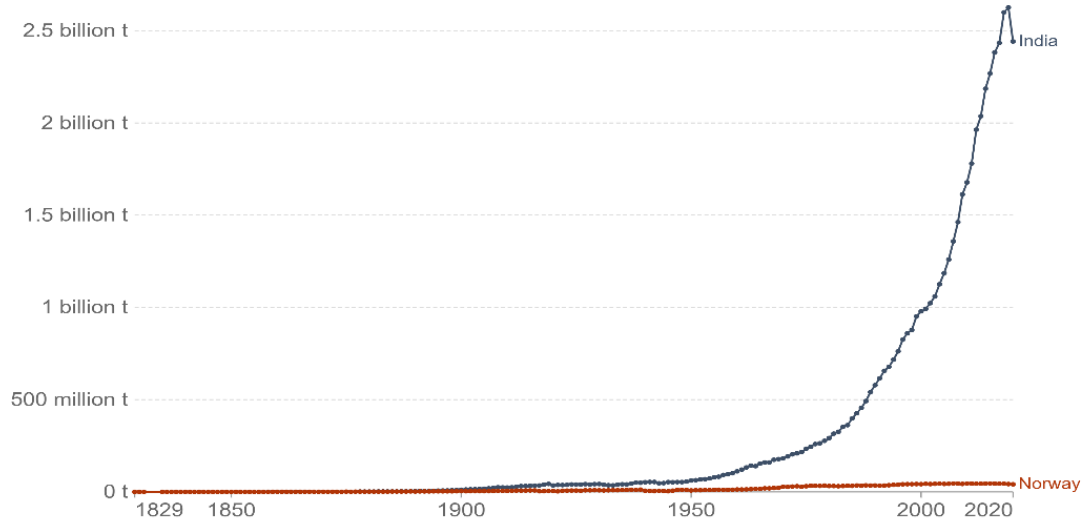
6. FINDINGS OF THE STUDY

- India has bigger area to almost 10 times than that of Norway and population 254 times higher than Norway. This shows that India is very populous country.
- India is far behind Norway in terms of Human Development Index. Norway is the world's leader with 0.957 HDI whereas India ranks 131 of 189 countries having 0.645 HDI.

- The rate of employment is also lower in India in comparison to Norway. India employs 42.4% people which is 67.2% in Norway. The rate of unemployment is also higher in India ranging to 7.11% and that of Norway it is 4.62%.
- Another major fact about poverty is that 7.7% of employed workforce is below the poverty line earning less than \$1.9 PPP per day and it is almost negligible in Norway. That is why, there is lack of proper data to find the rate of poverty in the country.
- Norway is a rich country as compared to India in terms of per capita income. It is \$67,389.9 in Norway and \$1,900.7 in India. The GDP of India is much higher than Norway. It is \$2,622.98 billion in India whereas \$362.01 billion in Norway being less populous and small in size. The national Income of India amounts to 8.82 lakh crore PPP dollars and it is 35,517.16 crore PPP dollars in Norway as per the World bank's report for the year 2020.
- The current PPP of Norway is \$66,020 in the year 2020 and for India it is \$6,390 for the same as per GNI per capita - purchasing power parity.
- The average lending rate to purchase a car is 4.44% p.a. effective with a condition of 35% own capital. In India the same ranges between 7.55% p.a. - 8.25% p.a. as per the data provided by State Bank of India, the largest bank in India.
- Norway's sales of electric car are much higher than that of India in numbers per year. For instance, Norway sold 76,000 battery electric cars in the financial year 2021 and the same was just 5,905 in India.
- Due to government commitments and various drafted policy measures, Norway has a very good AQI of 24 and regarded as one of the cleanest countries of the World. It ranks 101 of 106 countries in the list of most polluted countries among the world. Apart from this, India is the 3rd most polluted country after Bangladesh and Pakistan having an overall Air Quality Index (AQI) of 51.90 for the year 2020. The CO₂ emissions amounts to approx. 2.88 giga tonnes in 2019 and it very less on Norway. Norway accounts to only 0.1% of global CO₂ emissions.

Annual CO₂ emissions

Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.



Source: Global Carbon Project OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY
Note: CO₂ emissions are measured on a production basis, meaning they do not adjust for emissions embedded in traded goods.

Figure showing Annual CO₂ emission of Norway and India

SOURCE: (Ritchie & Roser, 2020)

- Norway produces clean electricity through the use of Hydro energy, Wind energy and Thermal energy. India has a huge share in electricity generation but the generation through various sources cause a lot of pollution. India produces 63% electricity through burning of coal and gas only which is an indicates a warning signal for sustainable development of the country.
- India lacks behind Norway in terms of incentives being offered to the consumers by the government to switch towards electric cars. The Norwegian government offers more lucrative benefits for the promotion of electric cars in the country. Also, the charging infrastructure of Norway is much better than India which may also act as a significant factor in the adoption of EVs.

7. CONCLUSION

Norway has a huge share of electric mobility in transportation. The major reason behind its growth is its favourable policy incentives which attracts the customers to buy EVs. The cost of purchasing an electric car is lower than that of an ICE due to higher rate of taxes on fuel-based vehicles. Further, the electric cars receive many perks as to reduced toll rates, concessional parking, etc. which is not so in India. In India, initial cost of purchasing an electric car is much higher as compared with the Internal combustion engine. Presently, India has a poor charging infrastructure. Also, the electricity generation in the country creates pollution.

India can only receive an edge in its EV market with overall strategic measures in which the vehicle ownership cost should be lowered somewhere equal to or below the traditional Internal Combustion Engine cars, the running cost can also be minimised through various incentives as being provided by the Norwegian government. Most importantly, the pace of establishment of charging points all over the country must be increased giving due emphasis to renewable sources of energy for electricity generation in order to minimize the well-to-wheel emission.

Government initiatives can only be made effective by spreading consumer awareness and strict emission norms. The same can be made as a part of the curriculum in the education system.

Government must take necessary steps to increase the level of employment and per capita income in the country. A positive environment is needed to be created in order to make the public switch towards electric mobility.

Many favourable contracts to influence the Original Equipment Manufacturers and other automobile manufacturers can be entered into at the national level so that they must start to invest more and more than in present to increase the production of EVs and bring in the economies of scale.

India can only lead in the long run only after effective follow-up of the policies framed at various levels to promote the electric mobility in the country.

References

- [1] (2019). Retrieved from IQAir: <https://www.iqair.com/world-most-polluted-countries>
- [2] (2020). Retrieved from worldometers: <https://www.worldometers.info/geography/largest-countries-in-the-world/>
- [3] (2021, April). (iea) Retrieved from [iea.org](https://www.iea.org/reports/global-ev-outlook-2021): IEA (2021), Global EV Outlook 2021, IEA, Paris <https://www.iea.org/reports/global-ev-outlook-2021>
- [4] Agrawal, M., & Rajapatel, M. S. (2020, January 07). Global Perspective on EV 2020. International Journal of Engineering Research & Technology, 9(1). Retrieved from <https://www.ijert.org/global-perspective-on-electric-vehicle-2020>
- [5] Bank Bazaar. (2021). SBI Green Car Loan for Electric Cars. Retrieved from [www.bankbazaar.com](https://www.bankbazaar.com/car-loan/sbi-green-car-loan.html): <https://www.bankbazaar.com/car-loan/sbi-green-car-loan.html>
- [6] Bjerkan, K. Y., Nørbech, T., & Nordtømme, E. M. (2016). Incentives for promoting Battery EV (BEV) adoption in Norway. Transportation Research Part D: Transport and Environment, 43, 169-180. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1361920915002126?via%3Dihub>
- [7] Cardekho. (2021, December 09). Top EV-friendly States In India That Offer The Best Incentives To Electric Car Buyers. Retrieved from [www.cardekho.com](https://www.cardekho.com/india-car-news/top-evfriendly-states-in-india-that-offer-the-best-incentives-to-electric-car-buyers-27251.htm): <https://www.cardekho.com/india-car-news/top-evfriendly-states-in-india-that-offer-the-best-incentives-to-electric-car-buyers-27251.htm>
- [8] Central Electricity Authority. (n.d.). Retrieved from [cea.nic.in](https://cea.nic.in/annual-generation-report/?lang=en): <https://cea.nic.in/annual-generation-report/?lang=en>
- [9] Chaturvedi, V., & Malyan, A. (2021, October 12). Implications of a Net-Zero Target for India's Sectoral Energy Transitions and Climate Policy. Council on Energy, Environment and Water. Retrieved from <https://www.ceew.in/sites/default/files/ceew-study-on-implications-of-net-zero-target-for-indias-sectoral-energy-transitions-and-climatepolicy.pdf>

- [10] Cloete, S. (2021, June 04). Norway an EV role model? Their pathway is expensive and paid for with oil & gas exports. Retrieved from energypost.eu: <https://energypost.eu/norway-an-ev-role-model-their-pathway-is-expensive-and-paid-for-with-oil-gas-exports/>
- [11] Dalvi, A. (2021, April 25). SMEV: Cumulative EV sales down 19.41 percent in FY2021. Retrieved from Autocar India: <https://www.autocarindia.com/car-news/smev-cumulative-ev-sales-down-1941-percent-in-fy2021-420595>
- [12] DNB Bank. (2021). Personal: Car Loan. Retrieved from DNB: <https://www.dnb.no/en/personal/loans/car-loans.html>
- [13] EVANNEX. (2021, October 29). INSIDEEVs. Retrieved from <https://insideevs.com/news/544280/norway-electric-car-adoption/>
- [14] Express Drives Desk. (2021, November 29). Retrieved from Express Drives: <https://www.financialexpress.com/auto/electric-vehicles/express-mobility-2021-ev-conference-in-depth-analysis-of-the-indian-ev-ecosystem/2378276/>
- [15] Kesari, J. P., Sharma, Y., & Goel, C. (2019). Opportunities and Scope for EVs in India. SSRG - IJME Journa, 6(5), 1-8. doi:10.14445/23488360/IJME-V6I5P101
- [16] knoema. (2020). India - CO2 emissions from transport. Retrieved from [www.knoema.com: https://knoema.com/atlas/India/topics/Transportation/CO2-Emissions-from-transport/CO2-emissions-from-transport](https://knoema.com/atlas/India/topics/Transportation/CO2-Emissions-from-transport/CO2-emissions-from-transport)
- [17] Macrotrends. (2020). Norway GDP 1960-2021. Retrieved from [www.macrotrends.net: https://www.macrotrends.net/countries/NOR/norway/gdp-gross-domestic-product](https://www.macrotrends.net/countries/NOR/norway/gdp-gross-domestic-product)
- [18] macrotrends. (2020). Norway Unemployment Rate 1991-2021. Retrieved from Macrotrends: <https://www.macrotrends.net/countries/NOR/norway/unemployment-rate>
- [19] Mishra, S., & Malhotra, G. (2019). Is India Ready for e-Mobility? An Exploratory Study to Understand e-Vehicles Purchase Intention. *Theoretical Economics Letters*, 9, 376-391. Retrieved from https://www.researchgate.net/publication/331325603_Is_India_Ready_for_eMobility_An_Exploratory_Study_to_Understand_e-Vehicles_Purchase_Intention
- [20] Mohanram, A.S. & Madhavi, C. (2013). A study on how Teenagers influence their parents to purchase a two wheeler for their use: An Empirical Analysis. *International Journal of Trade and Commerce-IIARTC*, 2(1), pp: 226-237
- [21] Narain, S. (2021, November 02). India's new climate targets: Bold, ambitious and a challenge for the world. Retrieved from *Down to Earth*: <https://www.downtoearth.org.in/blog/climate-change/india-s-new-climate-targets-bold-ambitious-and-a-challenge-for-the-world-80022>
- [22] Norsk elbilforening. (2021). Norwegian EV policy. Retrieved from [elbil.no: https://elbil.no/english/norwegian-ev-policy/](https://elbil.no/english/norwegian-ev-policy/)
- [23] Parulekar, S., Raj, A., Holmukhe, R., Raj, R., Mehta, S., & Karandikar, D. B. (2017, 08 01). Challenges in Transition from Internal Combustion Vehicles to EVs in India by 2030. doi:10.1109/ICECDS.2017.8389544
- [24] Ritchie, H., & Roser, M. (2020, August). CO₂ and Greenhouse Gas Emissions. Retrieved from [www.ourworldindata.com: https://ourworldindata.com/co2-and-other-greenhouse-gas-emissions](https://ourworldindata.com/co2-and-other-greenhouse-gas-emissions)

- [25] Rokadiya, S., Yang, Z., & Bandivadekar, A. (2019, 06 04). Incentivizing EVs to meet fuel consumption standards for passenger cars in India. The International Council on Clean Transportation. Retrieved from https://theicct.org/sites/default/files/publications/ICCT_EV_standards_India_20190604.pdf
- [26] Statista. (2019). Distribution of electricity production in Norway in 2019, by source. Retrieved from [www.statista.com: https://www.statista.com/statistics/1025497/distribution-of-electricity-production-in-norway-by-source/](https://www.statista.com/statistics/1025497/distribution-of-electricity-production-in-norway-by-source/)
- [27] Statista. (2020). Number of public charging stations for electric cars in Norway from 2011 to August 11, 2020, by type. Retrieved from [www.ststists.com: https://www.statista.com/statistics/696548/number-of-electric-car-charging-stations-in-norway-by-type/](https://www.statista.com/statistics/696548/number-of-electric-car-charging-stations-in-norway-by-type/)
- [28] Statista Research Department. (2021, March 02). Employment in Norway - statistics & facts. Retrieved from Statista: <https://www.statista.com/topics/6945/employment-in-norway/#dossierKeyfigures>
- [29] Stephens, T., Zhou, Y., Burnham, A., Wang, M., & Laboratory, N. A. (2018). Incentivizing Adoption of Plug-in EVs: A Review of Global Policies and Markets. Retrieved from <https://publications.anl.gov/anlpubs/2018/08/145318.pdf>
- [30] Sun, K., Xiao, H., Liu, S., You, S., Yang, F., Dong, Y., . . . Liu, Y. (2020). A Review of Clean Electricity Policies – From Countries to Utilities. *Sustainability* 2020, 12(19), 7946. Retrieved from <https://doi.org/10.3390/su12197946>
- [31] The Economic Times. (2021, December 03). Work underway to set up EV charging stations at 22,000 of 70,000 petrol pumps in country: Govt. Retrieved from [economictimes.indiatimes.com: https://economictimes.indiatimes.com/industry/renewables/work-underway-to-set-up-ev-charging-stations-at-22000-of-70000-petrol-pumps-in-country-govt/articleshow/88078743.cms](https://economictimes.indiatimes.com/industry/renewables/work-underway-to-set-up-ev-charging-stations-at-22000-of-70000-petrol-pumps-in-country-govt/articleshow/88078743.cms)
- [32] The World Bank. (2020). GDP per capita (current US\$) - Norway. Retrieved from [data.worldbank.org: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=NO](https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=NO)
- [33] The World Bank. (2020). GNI per capita, PPP (current international \$) - Norway. Retrieved from [data.worldbank.org: https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD?locations=NO](https://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD?locations=NO)
- [34] Trading Economics. (2020). India GDP. Retrieved from [tradingeconomics.com: https://tradingeconomics.com/india/gdp](https://tradingeconomics.com/india/gdp)
- [35] Trading Economics. (2021). India Worker Population Ratio. Retrieved from [tradingeconomics.com: https://tradingeconomics.com/india/employment-rate](https://tradingeconomics.com/india/employment-rate)
- [36] UNDP. (2020). The Next Frontier: Human Development and the Anthropocene. Retrieved from <http://hdr.undp.org/sites/default/files/Country-Profiles/NOR.pdf>
- [37] United Nations Development Programme. (2020). Human Development Index (HDI) Ranking. Retrieved from [hdr.undp.org: http://hdr.undp.org/en/content/latest-human-development-index-ranking](http://hdr.undp.org/en/content/latest-human-development-index-ranking)

- [38] Venkatesh. R (2012). User Gratification of a desire Services on TVS two wheeler in Karnataka, a case study in Mysore Abstract User. International Journal of Trade and Commerce-IIARTC, 1(1), 150-163.
- [39] Vishnoi, A. (2021, October 29). Retrieved from The Economic Times - e paper: <https://economictimes.indiatimes.com/news/india/india-will-be-part-of-the-solution-be-it-net-zero-emissions-or-other-issues-environment-minister-bhupender-yadav-on-cop26-climate-talks/articleshow/87344942.cms?from=mdr>
- [40] Wappelhorst, S. (2021, June). icct. Retrieved from International Council on Clean Transportation: https://theicct.org/sites/default/files/publications/update-govt-targets-ice-phaseouts-jun2021_0.pdf