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**GROWTH OF AN ELECTRIC  
VEHICLE INDUSTRY IN INDIA:  
Selected Policy Imperatives**

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*April, 1999*

*Prepared by:* Indian Zero Emission Transportation Project  
Contract No. LAG-00-98-00006-00  
Prime Contractor: Bechtel Corporation  
Sub-Contractor: TN Associates

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23865-107-0005

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### *Executive Summary*

This report represents a policy-oriented supplement to an earlier study that had concluded that electric vehicle (EV) appeared to be a natural option for India, given (i) the high level of urban air pollution in India that is primarily caused by vehicular emission, (ii) the nature of transportation needs and driving habits of the people, (iii) the basic features of the currently available EV technology, (iv) the resource balance of the country under different technology options, and last but not the least, (vi) the warm climate. Yet, the EV market has not grown in India.

The present work started with the objective of finding out if there is room for using appropriate fiscal incentives to boost the growth of an Indian EV market, but based on suggestions from industry representatives of current and potential EV manufacturers, the objective had to be enlarged to look at several policy imperatives. The perceived barriers to the emergence of an EV market may be broadly classified as economic (e.g. high costs of EV), technological (e.g., low-energy battery, low speed and low range per charge), knowledge-related (e.g., lack of complete awareness about EV), legislative (e.g., lack of legislative mandate favouring EV), and financial (e.g., lack of creative and innovative financing mechanism) barriers.

It must be noted that only a very handful of Indian auto manufacturers are currently or potentially interested in EV. Echoing their counterparts in the West, most of them think that the EV technology has to improve a lot still -- in terms of the range per charge of batteries and the average speed, and an environmentally viable system of recycling and disposing of batteries -- before it becomes commercially viable. Few think that EV is naturally suitable for Indian needs now. They feel that a lot can be done for India's environment by improving the fuel quality which, they claim, is among the worst in the world.

The industry representatives think that central excise and customs duties at the current rate will add about 28-35% to the cost of an EV, depending upon the import content. Most of them also feel that exemption of such duties by themselves will not do much in boosting the demand for EV. Almost all of them think that without a legislative mandate, the EV market will not develop in India. In the event of such a legislative mandate, this kind of tax incentives, coupled with innovative financing mechanisms, will definitely help the EV market take off in specific niches. Such incentives may take the form of a limited-period duty holiday, i.e., exemption from excise and customs duties for EV manufacturers, and/or a tax rebate or sales tax exemption for customers of EV, etc. The cost of these incentives could easily be justified in the long run by the savings in public health costs attributable to cleaner urban air.

It should be possible for traditional financial institutions to blend the higher capital cost, lower operating costs, and much longer life, of an EV through a creative financing package whereby the monthly out-of-pocket costs of an EV to a final customer would be comparable, or even cheaper, than that for a

comparable conventional vehicle. This kind of financing will encourage the average customer to try out a totally new product more easily. The replacement cost of batteries every two to three years could be quite prohibitive for many customers of EV, although this cost in all likelihood could be more than offset by savings from lower fuel and maintenance costs of EV over a much longer life time. Here again, an innovative leasing scheme could even out the out-of-pocket costs for the EV customers.

It appears that the greatest amount of efforts will be needed to ease or remove the knowledge barrier. This barrier is very significant in nature, even among the industry representatives, not to speak of many policy makers or the potential customers. It would require concerted actions on a sustained basis, on several fronts, to ease this barrier. It is important to deal with the industry and the policy makers first.

The knowledge-building exercises could take place through regular conferences, seminars, workshops, held under the auspices of industry associations, reputed academic and research institutions, and professional training institutes. Another effective measure would be to encourage active technology cooperation in the form of collaborative R&D projects, specifically in EV technology for two and three-wheelers. Such collaborative efforts may also need to be extended to appropriate marketing strategy for EV, particularly in correctly positioning EV in the market place. Market and policy-oriented research studies conducted through reputed Indian institutions may add a lot of credibility to the electric vehicle (EV) as a viable option for the future.

A successful introduction of EV in the Indian market will also require a lot of infrastructure-related investments preceded by detailed planning and market studies. These investments will be required in ensuring reliable power supply, installing a network of EV stations for charging batteries as well as replacing them, when necessary, and a servicing network. Appropriate incentives and policy support from the Government will be needed to encourage these investments.

In the final analysis, what is needed for the successful development of an EV market in India is a visionary approach to policy development, and a very pragmatic, sustained, and market-oriented approach to implementation

## INTRODUCTION: BACKGROUND TO THE STUDY

This is a policy-oriented supplement to an earlier study<sup>1</sup> that had concluded that electric vehicle (EV) appeared to be a natural option for India, given (i) the high level of air pollution in Indian cities that is primarily caused by vehicular emission, (ii) the nature of transportation needs and driving habits of the people, (iii) the features of basic EV technology, (iv) the resource balance of the country under different technology options, and last but not the least, (vi) the warm climate. A brief review of all of these factors is presented below.

### Environmental Urgency

On the environment front, three of the world's ten most polluted cities are in India. According to a World Bank study<sup>2</sup> and the United Nations<sup>3</sup>, the health cost of ambient air pollution may run into billions of dollars. In Delhi alone, it is US \$100-400 million per year. It is, therefore, not surprising that the Supreme Court of India felt compelled to issue deadlines<sup>4</sup> for several environment-friendly measures that the relevant governments and public sector organizations must obey. The two deadlines that are particularly relevant in the context of this report are (a) March 31, 2000, for "Replacement of all pre-1990 autos (*three-wheelers*) and taxis with new vehicles on clean fuels", and (b) March 31, 2001, for "Financial Incentives for replacement of all post-1990 autos and taxis with new vehicles on clean fuels".

### Transportation Needs and Driving Habits

That India is almost ideally suited in all respects for the Electric Vehicle, at least in some market niches, becomes evident from Table 1 that provides typical travel data for three of the largest Indian cities that together account for almost more than 50% of the total number of motor vehicles in the country. It shows that average distance traveled daily by two-wheelers and passenger

Table 1

Occupancy and Distance Travelled Daily in the Metros						
Cities	Average Occupancy (Persons)			Effective Distance Travelled Daily (km)		
	Two Wheelers	Three Wheelers	Cars	Two Wheelers	Three Wheelers	Cars
Bombay	1.6	1.8	2.4	25	68	26
Calcutta	1.6	1.8	2.6	25	68	26
Delhi	1.7	1.8	2.4	25	68	26

Source of Data: Tata Energy Research Institute (TERI)

cars is 25-26 kms, which is well within the range (per charge) of commercially available electric vehicle technology. Moreover,

70% of total travel is for business - work and education – reflecting routine travel, 22% for leisure, and 8% for other. Unlike in western nations, all forms of personal transport (passenger cars, motorbikes and scooters) in India are mostly driven within a single urban area, and inter-city travel by car is low. Moreover, average distance driven per personal vehicle per day is within 40-60 km. The average speed of the Indian traffic is also low because of narrow roads and inadequate number of highways. The average speed of travel in most cities is 15-40 km/h.

**Features of  
Basic EV  
Technology**

Even a very basic EV technology using lead-acid batteries can now let a small four-wheeler<sup>5</sup> go about 80 kms. for a single charge at an average speed of 40 km/h. It can reach a maximum speed of 60 km/h. These are all well within the parameters of transportation needs as portrayed above.

**Resource  
Balance of the  
Country Under  
Technology  
Options**

India's resource balance also favors EV. India's dependence on imported oil (currently at 50%) is steadily increasing with the growth of the conventional automobile industry. On the other hand, India has a large potential of hydro power<sup>6</sup>, an environmentally benign energy source, and abundant reserves of coal, and access to environment-friendly technologies to produce power from coal. Hydro currently represents only about 25% of India's power production. But hydro potential in terms of MW is considered to be almost as much as the total installed capacity in India right now, close to 100,000 MW.

**The Climatic  
Advantage**

Because of warmer climate and consequently warmer ambient temperature in most of the country, the EV technology does have an added advantage in India, compared to the western countries with cold climates. Electric motors would be expected to run more efficiently here.

**EV – A NATURAL  
OPTION FOR  
INDIA?**

All of the above factors, as summarized in Chart 1 on the following page, jointly point to the suitability of EV for the Indian market right now, at least in certain market niches (e.g., From a social stand point, market for EVs in India seems favorable because of the growing number of middle class with disposable income. In addition to extra income, the Indian middle class is educated and aware of deteriorating environmental quality of urban areas, and is most likely to invest into environmentally friendly technology, which can help create a viable market for products such as EVs).

**But the Indian EV Market is Yet to Grow**

In spite of these favorable factors and despite some government subsidies targeted to specific manufacturers who got into the EV business on a somewhat experimental basis, the EV market has not grown in India. What have been the barriers to the growth of an EV market in India? Could it be that right policies for nurturing steady growth of this market have not been in place? Questions such as these led to the present study that has been designed to take a quick look at some of the possible answers.

Market for Personal Transport Vehicles (PTV) in India:  
Appears to be Ideally Suited for Electric Vehicles (EV)

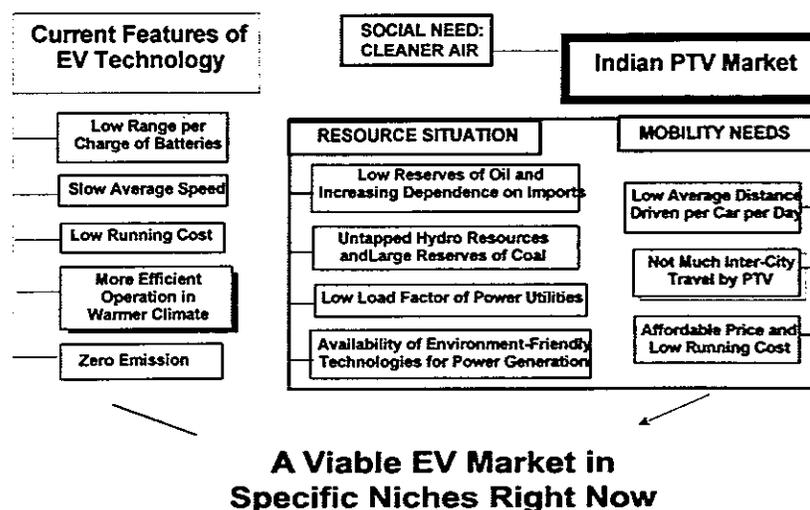


Chart 1

TN Associates 0608

**OBJECTIVE OF THIS REPORT**

The present work started with the objective of finding out if there is room for using appropriate fiscal incentives for removing some of the economic barriers to the growth of an Indian EV market, but based on suggestions from industry representatives of current and potential EV manufacturers, the objective had to be enlarged to look at several policy imperatives.

**METHODOLOGY FOLLOWED**

This report is based on a review of Indian taxes, particularly, the regime of indirect taxes that are relevant for the EV industry, followed by interviews with major Indian automobile industry representatives who have current or potential interests in EV. It must be noted in this context that only a handful of Indian auto manufacturers have current or potential interests in EV. The largest Indian automobile manufacturer does not have any interest in EV yet, because it feels that the EV technology is not "commercially viable yet". An analysis of the information gained

from the review and the interviews, and some of the suggestions and insights offered by the interviewees are presented in this report, along with a set of recommendations.

**CURRENT  
BURDEN OF  
INDIRECT TAXES**

The indirect taxes that typically apply to an automobile are excise duty, customs duty on any imported components, sales tax, road tax, octroi (duty levied on goods entering town or at the state border), and occasionally, special levy imposed mostly at the local level. Of these taxes, the first two are in the jurisdiction of the central government, while others are imposed by state or local governments. Under normal circumstances, an EV would also be charged these indirect taxes. Based on the responses from the industry representatives, all indirect taxes could account for anywhere from 35-50% mark-up to the total cost. Excise and customs duties could account for about 28% to 35%, depending upon the type of vehicle, and the import content. Three-wheelers attract less duties, in percentage terms, than four-wheelers<sup>7</sup>.

**Government  
Subsidy for EV**

On behalf of the Government of India, the Ministry of Non-conventional Energy Sources (MNES) has a Battery Operated Vehicles (BOV) demonstration program under which a capital cost subsidy is sanctioned by MNES to various government organizations and public or private sector firms to provide zero-emission and noiseless means of transport. A large public sector manufacturer and two private sector companies have manufactured and marketed EV-s with financial assistance from MNES under this program<sup>8</sup>. They also received some exemption from duties on special recommendations from MNES.

**A Theoretical  
Case for Fiscal  
Incentives**

In theory, a limited-period duty holiday could be beneficial if the demand for the product is very sensitive to price, so that expected revenue loss from exemption of duties is more than offset by growth in the size of the market, thus resulting in higher income and employment, and consequently, greater revenue for the government through other taxes.

**Reality Check**

There is practically a unanimity of opinion among industry representatives that a limited-time holiday from excise and duties on EV or its components would by itself have *almost no* impact on the growth of the EV market. According to them, the real barriers lie elsewhere.

**PERCEIVED  
BARRIERS TO  
THE EMER-  
GENCE OF  
AN EV MARKET**

The perceived barriers may be broadly classified as economic (e.g. high costs of EV), technological (e.g., low-energy battery, low speed and low range per charge), knowledge-related (e.g., lack of awareness about EV), legislative (e.g., lack of legislative mandate), and financial (e.g., lack of creative and innovative financing mechanism) barriers.

**Lack of a  
Legislative  
Mandate – the  
Real Barrier**

When asked to rank these barriers in terms of their importance as perceived by them, there was again an almost unanimity of opinion among the industry representatives that legislative barrier, or better, the lack of a legislation making use of low or zero-emission vehicles mandatory in certain uses or geographical areas, is the most important factor. In other words, they all feel that without such a legislative mandate, the EV market will not take off. This does not necessarily mean that all of the industry representatives want such a mandate right now.

**Knowledge  
Barrier**

Lack of awareness about what EV can deliver now, is also a major factor. This knowledge barrier is prevalent among all the relevant groups – the potential customers, the manufacturers, and the policy makers. Some concrete steps would be necessary for easing this barrier.

**Financial  
Barrier**

Against the assertion that EV should be a natural option for India, most of the industry representatives claim that an absence of attractive financial mechanisms may also be largely responsible for holding up the growth of the EV market, at least in certain market niches. Higher capital costs for EV could probably be offset by creative financing.

**Technological  
Barrier**

Next to the legislative barrier, the technological barrier appears to be the most important one in the minds of most of the industry representatives. They all feel that the EV technology has to go a long way still, to improve the energy density of batteries, speed of recharging, and setting up of the necessary infrastructure for faster replacement of batteries.

**Economic  
Barrier**

In the context of the above barriers, the economic barrier, that could be eased to some extent by limited-period duty-holiday, does not seem to rate very high in the minds of the industry representatives. But they all assert that such exemptions may be a good symbolic move to send a message to the market place that the government is in favour of promoting EV.

**Barriers Mostly  
Man-Made**

One may observe that except for the technological barrier, all of the above barriers are man-made. So, logically speaking, it should be possible to ease some of these barriers through appropriate actions.

**Psychological  
Barrier Related  
to Unreliable  
Power Supply**

In India's case, there is another specific barrier to EV that the industry representatives talk of, and that is the psychological barrier. In most of India, power supply is so unreliable that it is hard for people to think of a personal transportation device that will be dependent upon it. Of course, from a larger perspective, it can be construed that the power supply situation in India is bad also because of man-made reasons, and not because of any inherent reason like shortage of resources.

**SUMMARY OF  
FINDINGS**

Only a very handful of Indian auto manufacturers are currently or potentially interested in EV. Echoing their counterparts in the West, most of them think that the EV technology has to improve a lot still -- in terms of the range per charge of batteries and the average speed, and an environmentally viable system of recycling and disposing of batteries -- before it becomes commercially viable. Few think that given India's environment, energy resources, transportation needs, and driving habits, EV is naturally suitable for India. They feel that a lot can be done for India's environment by improving the fuel quality<sup>9</sup> which, they claim, is among the worst in the world. Almost all of them think that without a legislative mandate, the EV market will not develop in India. Central excise and customs duties at the current rate will add about 28-35% to the cost of an EV, depending upon the import content. Exemption of such duties by themselves will not do much in boosting the demand for EV. In the event of a legislative mandate for EV, this kind of tax incentives, coupled with innovative financing mechanisms will definitely help the EV market take off in specific niches. Concerns about the urban air pollution have been growing in the country. For the first time, the annual *Economic Survey 1998-99* of the Government of India felt compelled to include a section on issues related to sustainable development and the environment<sup>10</sup>.

**Potential Impact  
of EV on the  
Environment**

Arguments have been raised that the additional power generation that would be needed to charge the EV-s could still cause environmental pollution. This will be true if thermal power stations are used to provide power to charge the EV-s. But even

then, effective emission control systems (scrubbers) could be employed at these power plants and they could be located away from major urban centres. Moreover, there is also the possibility of using hydro power the great potential of which remains largely untapped, particularly at the Indo-Nepalese border. Thus, the total impact of urban air pollution, particularly on public health, could be significantly reduced. Moreover, time-of-use rates could be used to encourage charging of EVs during off-peak hours, thus improving the efficiency of existing power plants.

**CNG: the Current Focus of the Indian Auto Market**

In response to the growing concern about urban air pollution, and some initiatives by the public transit authorities of some cities, the focus of the Indian auto industry has recently shifted to vehicles fueled by compressed natural gas (CNG). Both Delhi and Mumbai public transit authorities, and those in several smaller cities have issued tenders for several hundred CNG buses. Consequently, most of the major automobile manufacturers have turned their attention to CNG vehicles, although natural gas is largely not a domestic resource for India.

**CURRENTLY VIABLE MARKET NICHES FOR EV**

Some of the niches that may be suitable for EVs right now are:

- Public transit (Some government-assisted battery-operated buses ply on short routes in Delhi and some other cities now);
- Second family cars normally used only for short distance commuting in metro cities;
- Scooters for personal and certain commercial delivery operations;
- Movement of material and men in large industrial estates;
- Utility services such as postal delivery vans, municipal services, etc.;
- Applications in airports and large tourist areas;
- Short to medium range vehicles belonging to governments;
- Pick-up vans for passengers, cargo, repair services, etc.

All of these applications will provide a sufficiently large EV market right now. What is required is faster development of the infrastructure support necessary for promoting EV for these applications. Once marketable 2/3 wheeler EV-s are developed, greater infrastructure support will be needed, particularly to support the EV auto-rickshaw service.

**SELECT POLICY  
IMPERATIVES**

In the context of the above discussion, what is needed now for the growth of a viable EV market in India is an integrated approach to policy development – taking into account considerations about the environment, energy, nature of transportation needs and public driving habits, and the infrastructure issues – to be followed by a series of concerted actions to implement the policies.

**Urban Air  
Pollution: the  
Prime Mover**

In all probability, the growing concern about urban air pollution will be the prime mover for the emergence of an EV industry in India. As the *Economic Survey 1998-99* of the Government of India points out,

“vehicular traffic is the most important source of pollution in all mega cities. The number of vehicles in these cities has increased manifold. Other reasons for high vehicular pollution are two-stroke engines, aged vehicles, congested traffic, poor roads and outdated automotive technologies and traffic management system. It is estimated that two and three-wheelers constitute about 75% of the total number of vehicles, and cause more than 50% of the total vehicular pollution load”.

**Influence of  
Western Outlook**

The necessity to take action to contain urban air pollution has already been recognized. However, EV still does not rate high in the minds of the Indian decision makers, most probably because of the influence of the typical Western outlook on EV. In the developed countries of the West, average speed of travel and average distance traveled per day is much higher. Consequently, EV is not considered viable. But, in India, the situation is just the other way around, but handful of decision makers at the moment look at it that way.

**Implicit Policy  
Objectives**

In the short run, the objective should be to build up awareness about the appropriateness of EV under the Indian conditions, and help develop the niche markets for EV that may already be viable. In the medium term, the objective should be to help development of appropriate EV technology for two and three-wheelers and the necessary infrastructure, since these vehicles currently account for 75% of all motor vehicles in India. In the long run, the total market should be open to EV, as and when appropriate.

**A Legislative  
Mandate for EV:  
to Begin With**

A legislation making zero-emission vehicles (ZEV) or low-emission vehicle (LEV) mandatory in certain geographical areas (city centres) or in certain use (such as delivery vehicles in metro cities) is almost essential to give a kick-start to the Indian EV

industry. In Mumbai, Delhi and Calcutta, there are already restrictions on certain types of vehicles plying in certain parts of the cities for better traffic movement. So, in a sense, mandatory legislation affecting the transport market, and the choice of technology, will not be unprecedented.

**Pilot Projects**

As a prelude to such mandatory legislation, pilot projects could be started in major urban centres - whereby the downtown core area (city centre) would be declared as "pollution-free islands" where only low-emission or zero-emission vehicles would be permitted to enter after a certain date announced well in advance. At the same time taxis, fleet owners and public transit vehicles would be given attractive incentives to switch to LEV or ZEV so that they can operate in the pollution-free islands.

**Financing of EV:  
Considerable  
Room for  
Innovation**

Contrary to popular expectations, an electric two-wheeler may in the long run be less expensive than its gasoline driven counterpart. In a study<sup>11</sup> presented at the Indo-US *Workshop on Electronic/Electric Vehicle 1995* in New Delhi, it was established that even if the initial cost of an EV is almost double that of its gasoline counterpart, the extra cost may be offset by EV's longer life and lower operating and maintenance costs. The CEERI study had shown that if only a 20% subsidy or tax exemption to the same extent is given on the initial cost, the life-cycle cost per km per passenger for an EV comes to about 35% of that of an equivalent gasoline driven vehicle. Based on these figures, no subsidy for EV would be required, if some innovative financing mechanism could be devised.

**Creative  
Financing**

It should be possible for traditional financial institutions to blend the higher capital cost, lower operating costs, and much longer life, of an EV through a creative financing package whereby the monthly out-of-pocket costs of an EV to a final customer would be comparable or even cheaper than that for a comparable conventional vehicle. This kind of financing will encourage the average customer to try out a new product more easily.

**Innovative  
Leasing Scheme  
for Batteries**

The replacement cost of batteries every two to three years could be quite prohibitive for many customers of EV, although this cost in all likelihood could be more than offset by savings from lower fuel and maintenance costs of EV over a much longer life time. Here again, an innovative leasing scheme could even out the out-of-pocket costs for the EV customers.

**Help from IFC,  
World Bank May  
Be Sought**

To reduce the perceived risk for Indian financial institutions venturing into these new areas, help in the form of equity participation from the International Finance Corporation (IFC), or soft loans from the World Bank could be sought, since both of these institutions are committed to promote environment-friendly investments.

**Fiscal Policy  
Imperatives**

Industry representatives believe that along with a legislative mandate in favour of ZEVs and LEVs, if fiscal incentives to both manufacturers and customers are offered, the EV market may take off more easily. Such incentives may take the form of a limited-period duty holiday, i.e., exemption from excise and customs duties for EV manufacturers, and/or a tax rebate or sales tax exemption for customers of EV, etc. The cost of these incentives could easily be justified in the long run by the savings in public health costs attributable to cleaner urban air. Delhi has recently reduced the sales tax on new auto rickshaws (three-wheelers) to help owners of commercial vehicles older than fifteen years (that have been recently banned on Delhi roads) to buy new ones.

**Dealing with  
the Knowledge  
Barrier**

It appears that the greatest amount of efforts will be needed to ease or remove the knowledge barrier. This barrier is very significant in nature, even among the industry representatives, not to speak of many policy makers or the potential customers. It would require concerted actions on a sustained basis, on several fronts, to ease this barrier. It is important to deal with the industry and the policy makers first.

**Knowledge  
Building  
Exercises**

Through regular conferences, seminars, workshops, held under the auspices of industry associations, reputed academic and research institutions, and professional training institutes, etc., general awareness about EV, and particularly its suitability for India, can be developed. The pilot projects suggested above will also help in this regard.

**Technology  
Cooperation**

Another effective measure would be to encourage technology cooperation in the form of collaborative R&D projects, specifically in EV technology for two and three-wheelers. Such collaborative efforts may also need to be extended to appropriate marketing strategy for EV, particularly in correctly positioning EV in the market place.

**Research Studies**

Market and policy -oriented research studies conducted through reputed Indian institutions like the National Council of Applied Economic Research (NCAER) or the Centre for Policy Research, or Indian Institutes of Management, etc., and effective dissemination of the outcome of these studies, may add a lot of credibility to the electric vehicle (EV) as a viable option for the future.

**Infrastructure-Related Issues**

A successful introduction of EV in the Indian market will require significant infrastructure investments preceded by detailed planning and market studies. These investments will be required in ensuring reliable power supply, installing a network of EV stations for charging batteries as well as replacing them, when necessary, and a servicing network. Appropriate incentives and policy support from the Government will be needed to encourage these investments.

**SUMMARY OF RECOMMENDATIONS**

Chart 2 on the following page provides a summary of recommendations based on the findings of this study. An order of priority for these recommendations is also suggested in the chart.

**Concluding Remark**

In the final analysis, what is needed for the successful development of an EV market in India is a visionary approach to policy development, and a very pragmatic, sustained, and market-oriented approach to implementation of these policies.

# Growth of an Electric Vehicle Industry in India: Select Policy Imperatives

## Recommendations at a Glance

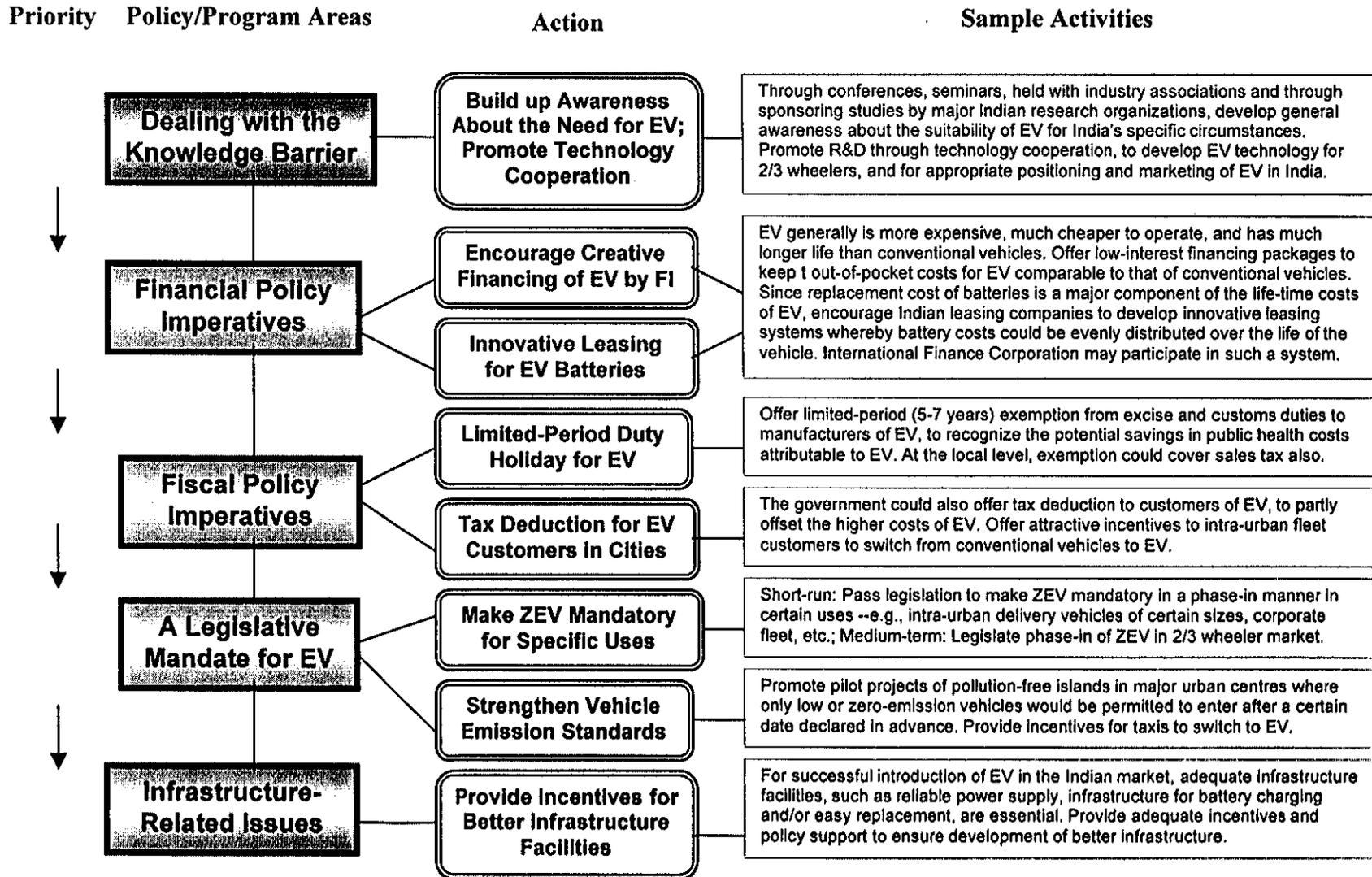


Chart 2

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## Endnotes

<sup>1</sup> *Electric Vehicle Investment Opportunities in India*, Energy Technology Innovations Project (USAID), Prime Contractor: Bechtel Corporation, 1997

<sup>2</sup> *The Cost of Inaction: Valuing the Economy-wide Cost of Environment Degradation in India*, by Carter Brandon and Kirsten Homman, The World Bank, 1995

<sup>3</sup> *Human Development Report, 1998*, pp 67, 79, United Nations, New York.

<sup>4</sup> *The Hon'ble Supreme Court Order* dated July 28, 1998, on Control of Vehicular Pollution in National Capital Region Including Delhi, as printed in *The Statesman*, New Delhi, Feb 4, 1999

<sup>5</sup> "Reva" electric vehicle prototype produced by Maini-Amerigon Corporation of Bangalore and California.

<sup>6</sup> *Hydropower & Dams World Atlas, 1998*

<sup>7</sup>

Relevant Current Rates of Duties		
Type	Central Excise Duty	Customs Duty
Two-wheelers with engine capacity not exceeding 75 cc	15%	
Two-wheelers with engine capacity exceeding 75 cc	25%	
Three-wheelers	15%	
Motor Cars	40%	
Motor vehicles for transporting 6-12 passengers	30%	
Motor vehicles for transporting more than 12 passengers	15%	
Batteries	18%	40%
Electrical controllers, etc.	13%	20%

*Central Excise Tariff of India 1998-99, and Customs Duty of India 1998-99*  
By R.K. Jain, Centax Publications Private Ltd., New Delhi

<sup>8</sup> The latest amount of subsidy was Rs. 2 lakhs (\$5,000 appx.) per vehicle. *Annual Report 1996-97*, page 86, Ministry of Non-conventional Energy Sources, Government of India

<sup>9</sup> Fully under Government control up till now.

<sup>10</sup> *Economic Survey 1998-99*, Ministry of Finance, Government of India, pp. 155-70.

<sup>11</sup> *Electric Vehicles and its Drive Technology*, by V.N. Walivadekar, Central Electronics Engineering Research Institute (CEERI), Pilani, India