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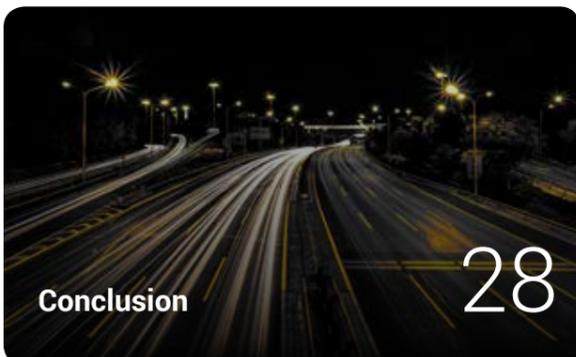


NITI Aayog

Roadmap for development of an Innovation Centre for Electric Mobility



Table of Contents

| | |
|--|--|
|  <p>Introduction 04</p> |  <p>Demonstration and Innovation Centres across the globe 07</p> |
|  <p>Establishing Electric Mobility innovation centres in India 18</p> |  <p>Impact of Innovation Centre 24</p> |
|  <p>Conclusion 28</p> | |

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We extend our sincere appreciation to all the stakeholders for their cooperation during the course of this study.



01 Introduction

India is one among the world's fastest growing major economies. The expeditious growth in India's urbanization, population and per capita income has had a pronounced impact on the mobility of its citizens and the number of vehicles on the roads have increased. Though this growth has tremendously elevated the competitiveness of India's mobility industries, pertinent challenges remain to be addressed in terms of pollution and climate friendliness. Electric Mobility is one of the key focus areas to counter India's air pollution and reduce GHG emissions. Faster transition to Electric Mobility will enable India to reach Net Zero target announced by Honorable Prime Minister at COP 26 in Glasgow in November 2021.

However, there are varied barriers and challenges that impede the proliferation of electric vehicles, of which limited awareness remains as a major challenge, also communicated during several stakeholder interactions. Educating the customers is the key to increasing awareness and several steps have been taken in this regard such as development of national web portal (e-AMRIT web portal), development of an app (e-AMRIT mobile app) and development of several state level awareness portals (e-VEG, TSEV, EV Jagruthi) etc. However, these steps when in addition with physical experience for the customers will act as a major contributor in overcoming the barrier of limited awareness. Physical experience can be provided to customers with help of innovation centres.

Several innovation centres have been built across the globe, across industries to promote awareness and acceptance of new ideas and technologies. These steps taken for mass awareness and education by building of innovation centres have proved successful in driving those ideas and technologies and facilitated their mass adoption. For example, Agricultural Technology Demonstration Centres (ATDCs) are set up in Africa to spread agricultural innovation, Innovation Demonstration Centre is set up by Lockheed Martin in the US for training and simulation facility for its military and aviation technologies. Climate Park and Innovation Centres are set up by Artefact gGmbH in Germany for promoting adoption of sustainable technologies such as solar, wind and biomass for energy, water-resource saving techniques and sewage treatment.

Alternative Indigenous Development Foundation Inc (AIDFI) has developed Technology development and training centres in Philippines. Additionally, Innovation Centres have also been built across the globe to promote electric mobility. The Electric Vehicle Experience Centre in England, Arnold Clark Innovation Centre in Scotland and Electric Vehicle Discovery Centres in Canada are some of the examples of electric mobility innovation centres.

Innovation centres for electric mobility in India will help to explain the benefits of EVs while highlighting the line-up of EVs and charging infrastructure currently available. The facility will not be intended as an EV sales location, but as a priority to education on EVs as India aims to achieve electrification of 70 percent for commercial cars, 30 percent for private cars, 40 percent for buses, and 80 percent for two and three-wheelers by 2030.

The centre will also provide opportunity to Charge Point Operators (CPOs) to exhibit the availability of charging stations so customers can charge their EVs. It will instill a sense of confidence in customers that everything is up and running today and is futureproof for tomorrow, with the capacity to manage the exponential growth of EV charging. It will enable CPOs to provide brand exposure and thus, increase footfall at their EV Charging Stations (EVCS).



The facility will not be intended as an EV sales location, but as a priority to education on EVs as India aims to achieve electrification of 70 percent for commercial cars, 30 percent for private cars, 40 percent for buses, and 80 percent for two and three-wheelers by 2030.

An innovation centre will lead to a series of positive impacts, including increased confidence among customers and hence increased adoption of electric vehicles, skill enhancement of staffs and the development of innovative business models. It will provide a brand neutral, unbiased facility dedicated to providing free, non-technical education and information on EV technologies and encourage EV uptake. This approach will help address the fact that a longer customer consideration period is required for EV adoption and that a standard non-educational sales-led approach by Original Equipment Manufacturers (OEMs) in targeting potential new EV customers is not suited to this.

The innovation centre will aid several stakeholders such as OEMs and CPOs in introducing their

businesses to the consumers and meet the anticipated wholesale consumer move to EV's – for both retail and business customers. Anecdotally, in case of EVEC and ACIC, OEMs provided good feedback in terms of customer experience, model, and brand exposure and ultimately, sales conversion.

Mass awareness and education through Innovation centres for electric mobility in India are key to accelerating adoption of EVs in India. This paper further elaborates on how Innovation Centre could be implemented in India in different cities by learning from best example across the globe and across industries. The paper also elaborates on the roles and responsibilities of several stakeholders to bring such an Innovation Centre into reality and also assesses impact created by it



02 Demonstration and Innovation Centres across the globe

Innovation centres act as safe havens for new ideas and technologies. Several innovation centres have been built across the globe for various industries to promote these new ideas and technologies. The following section consists of examples of innovation centres for electric mobility as well as other industries.

Innovation Centres for other industries across the globe

Many Innovation Centres have been set up across the globe. Agricultural Technology Demonstration Centres (ATDCs) are set up in Africa to spread agricultural innovation across Africa. Innovation Demonstration Centre is set up by Lockheed Martin in the US for training and simulation facility for its military and aviation technologies. Climate Park and Innovation Centres are set up by Artefact gGmbH in Germany for sustainable technologies. Alternative Indigenous Development Foundation Inc (AIDFI) has developed Technology development and training centres in Philippines. This section illustrates the models and functionalities of these innovation centres.

Agricultural Technology Demonstration Centres (ATDCs), China- Spreading agricultural innovation across Africa

ATDCs have been set up by the Chinese government across different African nations following a PPP approach. Useful technologies such as hybrid seeds, modern fertilizer, etc. are demonstrated by both visits to agricultural communities and by inviting farmers to these centres. These farmers not only implement what technologies they can, but also act as ambassadors once educated in these methods. Research, training, and outreach is conducted alongside the use of modern farming techniques and animal husbandry.

They follow a combined aid and commerce philosophy, where centres are constructed in partnerships with businesses and are financed by the state for the first 3 years while they become sustainable. Businesses spend this period conducting outreach and refining their offerings according to local needs and purchasing power. Following this period, they are

entirely self-financed by selling agricultural products and technological solutions to customers directly. Farmers also join these centres directly, applying these methods to their land and jointly generating income.

These sites are also used to scale up pilots and spread desirable technologies. These may be done independently by business or in partnership with government programs. They have achieved a number of successes. For example, Tanzanian farmers have joined these centres in large numbers after observing the high yields achieved by seed varieties in ATDC run farms.

Lockheed Martin, US- Innovation Demonstration Centre

Lockheed Martin runs a large training and simulation facility for its military and aviation technologies. Owing to the highly technical and disruptive nature of such technologies, Lockheed Martin has created this demonstration facility for its wide variety of products. It recognizes that the best way to clear skepticism regarding innovations is hands-on demonstration with the help of a large number of on-site experts, testing grounds, and training equipment.

The facility also serves as a meeting place for industry and other professionals to improve B2B interaction and further align the facility's operations and the kind of products on display with the industry's needs. The facility is designed to be modular and constantly changes to accommodate feedback, new innovations, and customer needs.

Artefact gGmbH, Germany- Climate Park and Innovation Centres

Artefact is a non-profit organization in Germany dedicated to applying and disseminating sustainable technologies. They focus mainly on using wind, solar and biomass for energy, water-resource saving techniques and sewage treatment. They maintain several centres, where technologies are developed, tested, and demonstrated to the public.

Over 10,000 visitors come each year to see the biogas plants, Nubian vaults, firewood saving cookers, irrigation and electrification systems for different climatic conditions operated here. Artefact also

organizes excursions and events for their visitors.

Besides this, the centres can be used for training workshops, seminars and conferences related to sustainable development. Their centres won the 1998 European Solar Prize.

Figure 1: Climate Park and Innovation Centres, Germany



Alternative Indigenous Development Foundation Inc (AIDFI) Techno Park, Philippines- Technology development and training

Alternative Indigenous Development Foundation Inc. (AIDFI) was founded in the Philippines in the 1990s. Since then, it has been developing technologies to aid agricultural production and take care of people's basic needs such as water and sanitation in a cheap and renewable manner. They believe these technologies are key to solving poverty and hunger problems in rural communities.

The AIDFI Techno Park is an area where different technologies which AIDFI develops are displayed. Besides this, it has a large learning centre with visual and audio facilities. It can also be rented for trainings and conferences. AIDFI has a range of technologies, including hydraulic ram pumps, rope pumps, biogas digesters, micro hydro, windmills, rice hull stoves, rotary weeder, ferro-cement technology, etc.

AIDFI also focuses on Solar entrepreneurship, educating and raising awareness about the benefits of solar technology beyond the initial ROI calculation.

Figure 2: AIDFI Techno Park, Philippines



Innovation Centres for Electric Mobility across the globe

Many Innovation Centres have been set up across the globe to promote Electric Mobility. The Electric Vehicle Experience Centre and Arnold Clark Innovation Centre are two such centres set up in the UK. While Electric Vehicle Discovery Centres are set up by Plug'n Drive in Canada. This section illustrates the operating models, lessons learnt and positive impacts of these innovation centres.



Over 10,000 visitors come each year to see the biogas plants, Nubian vaults, firewood saving cookers, irrigation and electrification systems for different climatic conditions operated here.

Electric Vehicle Experience Centre (EVEC), England

The EVEC is located centrally in Milton Keynes in the Centre:mk shopping centre. It was the first Centre of its kind to open in July 2017 and is a 5-year project. It was built to provide a brand neutral, unbiased facility dedicated to providing free, non-technical' education and information on EV technologies and encourage EV uptake.

Figure 3: Electric Vehicle Experience Centre (EVEC)



The Electric Vehicle Experience Centre has been developed in association with Milton Keynes Council and British Petroleum (BP) Pulse along with OEM partners. Milton Keynes Council has provided 60% funding to the EVEC whereas British Petroleum (BP) Pulse (formerly Chargemaster) has provided 40% funding. Further, OEM Partners – VW, Renault, Vauxhall, Audi, and Skoda – each are charged a 'Manufacturer Sponsorship Fee' as part of BP Pulse's funding contribution.

As part of the 40% Chargemaster funding and set up of the Centre identified above, OEMs were invited to support the set-up of the Centre with a financial contribution – a 'Sponsorship Fee'. This had a mixed response from OEMs initially, with some reticent and wanting to hold back to see how the Centre developed, while others were more pioneering and supportive. A total of six manufacturers engaged initially, other OEMs have continued to join, with most recent examples being Skoda and Audi.

So, even though the information and advice provided is indeed brand neutral the vehicles displayed and available for test drive are those from current OEM Partners providing the 'Sponsorship Fee'. The feedback has been positive from all the stakeholders such as the OEMs. Additionally, a lot of positive reviews were also received from customers, such as:



The EV Experience Centre is a wonderful concept that can really make a difference to the way the general public see electric cars. I'm excited to see its progress.



Very helpful EV gurus at the Centre. They are very knowledgeable and answered all of my questions. This is a great opportunity to see what it is like to have an EV in the real world. Thoroughly recommend the experience – it will change your perception of EVs.



Excellent experience. Knowledgeable and friendly gurus with all the information you could need to know about EVs. It's confirmed to us that we can easily become a fully EV household.

¹ <https://www.skoda.co.uk/news/details/ev-experience-skoda-joins-innovative-retail-concept-in-milton-keynes>

² <https://www.mkfm.com/news/news-extra/audi-joins-the-ev-experience-centre-in-milton-keynes/>

Arnold Clark Innovation Centre (ACIC), Scotland, UK

Opened in January 2021 and built on the site of an ex-car dealership to the west of Glasgow, conveniently located just over five miles (and a twelve-minute drive) from the city centre. Like EVEC, it was established as a dedicated innovation, information, and educational Centre, also linking strongly with Arnold Clark's own philosophy of fully understanding both the needs and ensuring the product is right for the customer. A showcase for the available range of Alternate Fuel Vehicles (AFVs) and without OEM bias, to educate both customers and Arnold Clark's own employees.

Figure 4: Arnold Clark Innovation Centre (ACIC)



With the 2030 ban on sales of petrol and diesel vehicles in the UK, the Centre was seen to be the key to facilitate Arnold Clark getting 'ahead of the curve' in transitioning their business to meet the anticipated wholesale consumer move AFVs – for both retail and business customers. In addition, the Centre was also seen as being well placed in terms of both facilities and location to provide industry training because of Glasgow's strong historical links to industrial innovation and heritage, increasing evidence of an emerging skills gap and an increasing number of e-mobility 'start-ups'.

The Arnold Clark Innovation Centre has been developed in association with Transport Scotland, OLEV, Scottish Power, Energy Saving Trust, Go Ultra Low, Strathclyde University and the NVT Group, Hawthorne. Scottish Power has a long-standing partnership with Arnold Clark. Scottish Power, as a 100% renewable energy generator, is Arnold Clark's official 'Charging Partner'. Transport Scotland / Energy Saving Trust has been responsible for funding and facilitating the Rapid Chargers on site. IT or Technical Services required by the Arnold Clark Innovation Centre (ACIC) has been provided by the NVT Group. Apart from this, Arnold Clark has sponsored PhD research in carbon reduction at the University of Strathclyde university.

Example Customer Reviews:



This place is a MUST if you are thinking of buying an Electric or Hybrid Car. Hazel was so informative and provided lots of professional advice across a number of different car manufacturers. No sales at the site were an added bonus of not feeling under any pressure. The service was so good that we have ordered an EV from our local Arnold Clark branch.



Had a fantastic experience at the innovation centre this week. Ross was extremely knowledgeable and passionate about all things electric cars. We were offered the chance to test drive a range of cars at short notice and provided great insight into their features. If you are curious about learning more about electric cars and thinking about making the switch, this is the place to come... professional, knowledgeable and sales free environment. Superb.



A very productive morning spent helping two sets of relatives to choose their next electric car. The Innovation Centre has a wide range of models of EV available to test drive, and the staff are all friendly, helpful and knowledgeable. All of our questions were answered and at no point did we feel under any pressure to buy anything - this Centre is all about education, not sales, and it really shows.



I had great fun today. I got to test drive all the cars I wanted and got to pick Stewart's brains about all things EV. Great service and no obligation. A super experience and helpful in making informed decisions.

There are no financial contributions from any OEM, although MG for example have provided a drivetrain for display in the Innovation area of the Centre. The Centre has over 60 electric and hybrid vehicles available for test drive and showcasing from manufacturers that Arnold Clark currently has agreements with. However, to help reinforce brand neutrality and minimize bias, additional vehicles from across the rest of the market have been purchased outright by Arnold Clark from OEMs having no manufacturer agreements – specifically Tesla, Nissan and Polestar.

Anecdotally the positive customer feedback and particularly the opportunities to engage local businesses – all combined with educating and training their own staff to promote the benefits of EVs.

Finally, to support the positive impact of the Centre, Arnold Clark has opened a new Innovation Centre at their Stafford Site in April 2022 which has no other stakeholders but will include charging facility, together with a Starbucks Café - providing another aspect to the Innovation Centre model and how effective such supporting facilities may be for future planning and development of other centres.

Plug'n Drive, Canada- Electric Vehicle Discovery Centres and Road Shows

Plug'n Drive is a not-for-profit organization that runs multi-brand experiential centres and partners with road shows to provide test drive facilities and expertise to prospective customers. Their goal is to accelerate EV adoption and maximize the related environmental and economic benefits. Customers can learn about these in a no-pressure, no-sales environment and test drive the latest models of EVs. They are educated on the benefits of switching to EVs through exhibits and friendly, knowledgeable experts.

Plug'n Drive conducted a study among Canadians to determine the reasons behind lower-than-expected EV dealership sales. Unavailability of on-lot vehicles for test driving, less knowledgeable sales personnel,

and customer unfamiliarity were found to be major contributing factors. To address these, they opened their first Electric Vehicle Discovery Centre in 2015 and have had several partnerships with road shows across Canada since then. These include charging equipment demonstrations alongside electric vehicles.

instructions for Canadian citizens on how to enroll in programs such as the Scrappage Incentive Program and Used EV Incentive Program. They provide step-by-step guidance on the installation and maintenance of charging equipment and the necessary permissions customers need to obtain. They also maintain a calendar of events that they will conduct throughout the year.

Figure 5: Electric Vehicle Discovery Centre



Table 1: Key stakeholders and their contributions in Electric Vehicle Discovery Centres

| Partners | Contributions |
|--|---|
| Plug'n Drive | <ul style="list-style-type: none"> Running Discovery Centres - Providing test drivers, accompany drivers, create exhibits, and educate customers. Mobile Electrical Vehicle Education Trailer (MEET), a mobile EV awareness hub that can participate in Road Shows Charging equipment demonstrations and training. |
| Toronto Atmospheric Fund, TD Bank | <ul style="list-style-type: none"> Funding and other financial expertise to sustain operations |
| Electric Vehicle Manufacturers- Chevrolet, Hyundai, Kia, Polestar, Volvo | <ul style="list-style-type: none"> Supply vehicles and related technical specifications and other marketing information to be shared with customers. |
| EV Charging Services/OEMs- Alectra, elexicon, Spark, etc. | <ul style="list-style-type: none"> Providing charging stations for demonstration and for supporting needs of the Discovery centre |
| Power Distribution Companies- OPG, Toronto Power etc. | <ul style="list-style-type: none"> Additional sponsorship Expertise on the installation and operation of EV charging infrastructure, related costs, regulations, and available policy incentives |

The initiative proved highly successful, with over 10,000 visitors in the first year taking part in over 4,000 test drives. Post-visit surveys showed 94% willingness to make the switch, with almost 25% of visitors buying an electric vehicle within 3 months of their visit. Though initially hesitant to share floor space with their competitors, OEMs have now come to realize the benefits of participation.

Plug'n Drive also provides a wealth of information on its website, such as FAQs, benefits, incentives, and

Lessons learnt from Electric Mobility Innovation Centres

Lessons learnt from the three innovation centres, Electric Vehicle Experience Centre (EVEC), Arnold Clark Innovation Centre (ACIC) and Plug'n Drive, are summarized below:

Table 2 : Lessons learnt from Electric Mobility Innovation Centres



03 Establishing Electric Mobility innovation centres in India

EVs are still an early-stage technology, with 0.8 percent penetration in India (as of December 2021). To achieve target electrification of 70 percent for commercial cars, 30 percent for private cars, 40 percent for buses, and 80 percent for two and three-wheelers by 2030, the technology maturity pathway for EVs needs to move faster than is typical for an emerging technology. For achieving faster maturity pathway, it is necessary that EV adoption becomes rapid and widely accepted among all sections of the population.

Research shows that early adopters of EVs tend to be higher income, well educated, and predisposed to environmentally friendly technologies. For example, consumers with the highest intent to purchase an EV were more likely to be highly educated and environmentally conscious. But rapid adoption of electric vehicles by low-income and disadvantaged populations is necessary for decarbonization. Pioneering solution such as an Innovation Centre is critical to address disparities in EV adoption and accelerate adoption.

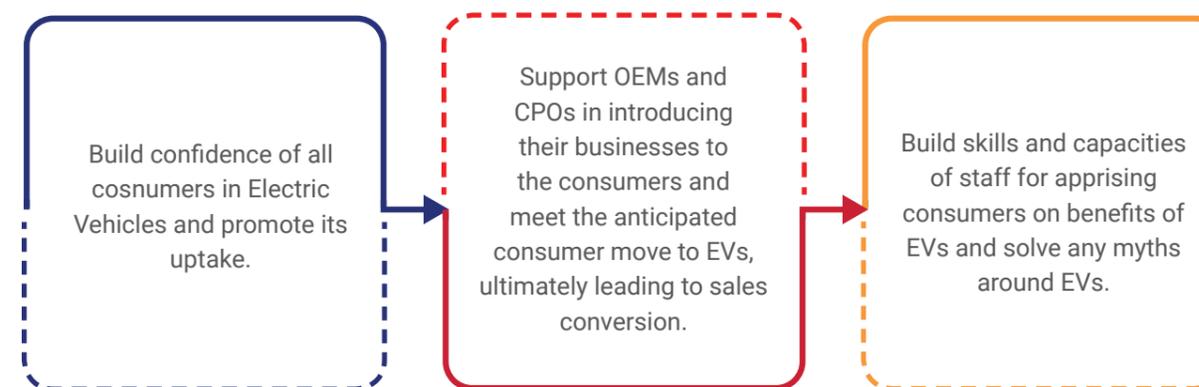
The innovation centre is an innovative, effective and sustainable solution for promoting brand



The innovation centre is an innovative, effective and sustainable solution for promoting brand neutral, unbiased facility dedicated to providing free, non-technical' education and information on EV technologies and encourage EV uptake among all sections of the population.

neutral, unbiased facility dedicated to providing free, non-technical' education and information on EV technologies and encourage EV uptake among all sections of the population. Additionally, it will help address the fact that longer customer consideration period is required for EV adoption and that a standard non-educational sales-led approach by OEMs in targeting potential new EV customers is not suited to this. Thus, Innovation centre will deliver on three key aspects:

Figure 6: Key aspects of Innovation Centre



The details involved in the development of innovation centre such as roles and responsibilities of stakeholders, structure of innovation centre, business model and sustainability of proposed business model are discussed subsequently.

³ <https://economictimes.indiatimes.com/industry/renewables/electric-vehicles-a-roadmap-to-mass-adoption-in-india/articleshow/88336832.cms?from=mdr>

⁴ Sanya Carley et al., Intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cities

Mapping of potential stakeholders in the EV ecosystem

Stakeholders in any ecosystem affect or are affected by the ecosystem's services and play different roles in the management and use of the services. The key stakeholders in the EV ecosystem are as follows:

Figure 7: Key stakeholders in the EV ecosystem



Approach for setting up Electric Mobility Innovation Centres

The process of establishing the innovation centre will require active participation of several stakeholders of the EV ecosystem. This section contains list of these stakeholders along with their roles and responsibilities. The section also covers financing options, possible business models, a suggestive revenue model and structure of the innovation centre.

Financing innovation centres in India

Establishing the innovation centres will require financing for initial two to three years post which it will become self-sustaining. The major financing sources/options available for the setting up innovation centres in cities of India are:

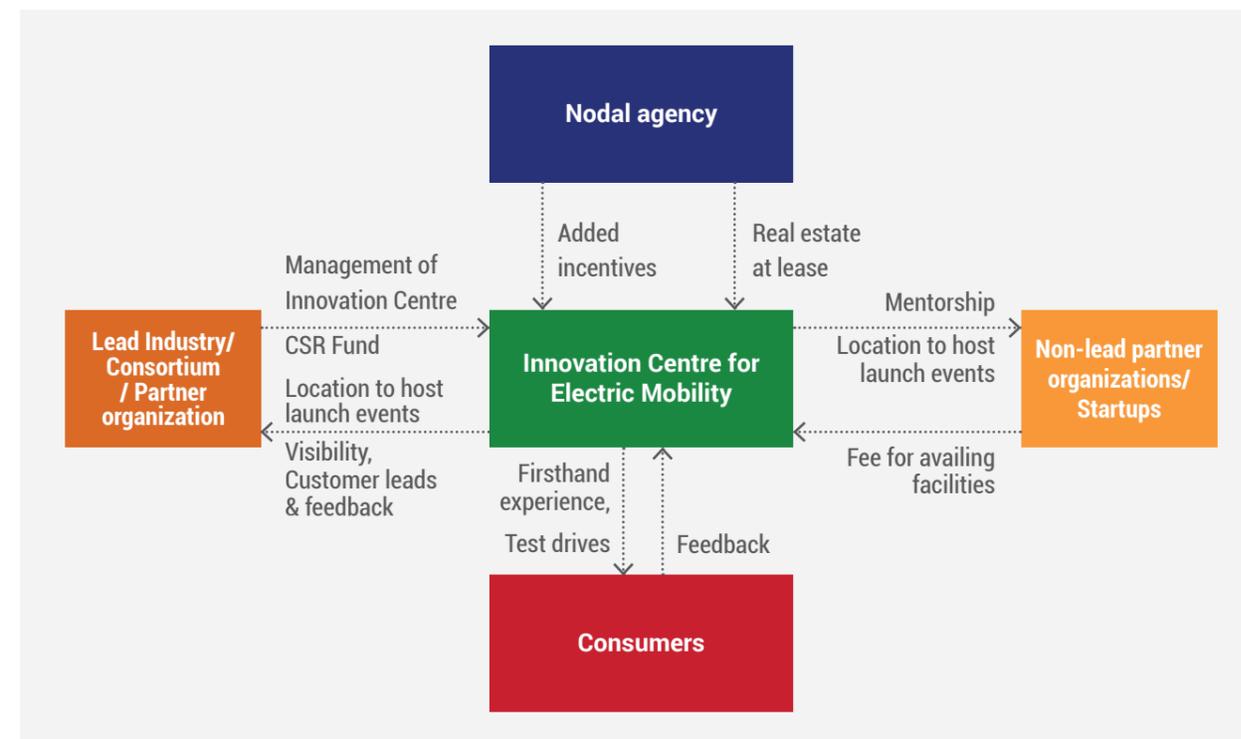
- Financing through OEMs and CPOs
- Financing through Public-Private Partnership (PPP) model
- Financing through Non-Governmental Organizations (NGOs) / Non-profit Organizations / Bilateral or Multilateral Organizations

Business models for innovation centres in India

• Lead Partner OEM mode:

The centre will be initially supported by the lead partner organization in the establishment and functioning, as the centre gains more visibility, the revenue generation would lead to a self-sustained operation. To develop an EV Innovation Centre in city of India, a possible business model which can be used is shown in the below figure:

Figure 8: Possible business model for the EV Innovation Centre



The innovation centre will be managed by a lead partner OEM. Lead partner OEM will establish a relationship with the state government to obtain land & trunk infrastructure at lease and utility services and additional incentives. The lead partner OEM will ensure that the innovation centre serves as a holistic experience centre for the customers. It will shoulder the responsibility of complete management of innovation centre and will initially support in the establishment and functioning of the centre. Additionally, it will have the responsibility of bringing on board other partner OEMs, manage the pooled resources, display of vehicles and components and deployment of trained experts. Other partner OEMs will provide vehicles for test drives and host launch events, roadshows etc. at the centre.

• OEMs' and CPOs' collaboration mode:

The centre will work with collaborated efforts of all OEMs and CPOs. They would finance, plan and implement the activities to be carried out at the innovation centre. They will collectively hold the responsibility of acquiring land & trunk

infrastructure at lease from the state government and hold complete responsibility of management of the centre.

Role of stakeholders in setting up the Electric Mobility innovation centre

The process of establishing these innovation centres involves stakeholders such as state governments, OEMs, CPOs, NGOs and other organizations. Roles of each of these stakeholders is listed below:

• Original Equipment Manufacturers (OEMs):

Electric Mobility Innovation Centres will provide the Indian OEMs the opportunity to develop dealership partnerships to create EV experience and demonstration zones across the country and provide consumers driving experience of electric 2Ws, 3Ws, and 4Ws.

The roles and responsibilities of OEMs are as follows:

- Provide electric vehicles for test drives

- Establish a relationship with the state government to obtain land & trunk infrastructure at lease and utility services and additional incentives
- Management of innovation centre with initial support in the establishment and functioning
- Display of vehicles and components
- Deployment of trained experts
- Host launch events, roadshows etc.

Building these demonstration and innovation centres in partnership will bring the reality of transition of Internal Combustion Engines (ICE) vehicles to EVs one step closer and develop confidence in the consumers.

• State government:

State governments have an important role to play in facilitating increased adoption of electric vehicles in their respective states. The State government will:

- Provide land & trunk infrastructure at lease and utility services and additional incentives.

• Charge Point Operators (CPOs)

Electric Mobility Innovation Centres will provide the CPOs the opportunity to display availability of charging infrastructure in the city/state and thus help overcome the doubts in the mind of the customers regarding limited charging infrastructure. The CPOs will:

- Provide charging equipment for facilitating testing of the equipment by the customers at the centre.
- Provide financing and management support

• Non-Governmental Organizations (NGOs) / Non-profit Organizations / Bilateral or Multilateral Organizations

The Collaboration of Innovation centre with NGOs / Non-profit Organizations / Bilateral or Multilateral Organizations can be done to conduct city-wide ride and drive events during public festivals which will give future users a first-hand electric vehicle experience. Thus, NGOs / Non-profit Organizations / Bilateral or Multilateral Organizations will:

- Provide with funds and resources to facilitate organization of city-wide ride and drive events, road shows etc. to promote usage of EVs among customers.
- Provide support in salaries of the staff working in the centre.

Self-sustained Innovation Centre with well-defined revenue model

For the successful operation of the innovation centre, it is necessary that the innovation centre be made sustainable in long term aspect. The centre will generate revenue through provision of expertise and support activities to various stakeholders. The revenue generation would lead to a self-sustained operation. The key revenue streams considered for the centre are provided in the table below:

Figure 9 : Revenue streams of innovation centre



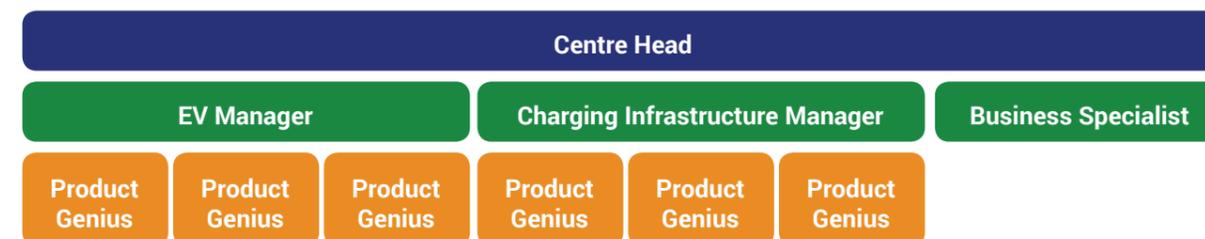
Structure of the Innovation Centre

The primary function of this innovation centre is to facilitate removal of barriers and constraints faced by customers and promote adoption of EVs, it is critical to develop a professional structure which will be pivotal in its smooth and efficient functioning. As an illustrative, below figure gives insight into the likely framework for functioning of the centre.



For the successful operation of the innovation centre, it is necessary that the innovation centre be made sustainable in long term aspect.

Figure 10: Structure of Innovation Centre



The staff at the innovation centres will be equipped with knowledge of all EV variants available and provide consumers the benefits of switching to e-mobility. The innovation centre will be housed with two managers, and five dedicated product geniuses, who will be experts in EVs to answer all questions

about vehicles on site. A business specialist will also be housed in the centre to advise organizations on next steps for looking to electrify their fleets. The key role and responsibilities of the identified resource in the above section are proposed in the table below:

Table 3 : Roles and Responsibilities of identified resources at Innovation Centre

| Position | Roles and Responsibility |
|--|--|
| Centre Head | <ul style="list-style-type: none"> • Preside over the meetings of the Innovation Centre • Guiding the Innovation Centre • Escalate the concerns and seek clarification from the State Ministry |
| EV Manager | <ul style="list-style-type: none"> • Provide inputs on how OEMs can be brought on board and maintain relationship with these OEMs • Facilitate bringing EVs on board for test drives • Developing solutions for addressing the identified barriers that can be overcome for adoption of EVs to address the concerns of the customers • Provide inputs to the Centre Head on areas of concern • Provide training to product geniuses • Review of various events proposed to be undertaken by the partner OEMs |
| Charging Infrastructure Manager | <ul style="list-style-type: none"> • Provide inputs on how CPOs can be brought on board and maintain relationship with these CPOs • Facilitate bringing EVCI on board for showcasing it to customers • Provide inputs to the Centre Head on areas of concern • Provide training to product geniuses |
| Business Specialist | <ul style="list-style-type: none"> • Advise organizations, which are looking to electrify their fleets |
| Product Specialists | <ul style="list-style-type: none"> • Provide suggestions on projects that can be taken by partner OEMs • Formulate engagement activities that can be undertaken to promote adoption of EVs among customers • Answer all questions/queries about vehicles on site • Facilitate test drives and impart benefits of EVs |

04 Impact of Innovation Centre

This section provides an overview of the impact that the innovation centre will have on the EV adoption. Generic impact on the EV upscaling as well as the product and technology confidence among the buyers are discussed further. The innovation centre will also help achieve Prime Minister's target of net zero carbon by 2070 as the electrification of transport will cut down the emissions.

Generic Impact on improving EV registrations

The experience of users at the innovation centre and a chance to talk to knowledgeable and passionate people who have insights to all the features of the EV will give more confidence to the end users to purchase EV. Added to the fact that there is no sales pitch and preference for any dedicated car manufacturer, gives room for more open discussion as to the benefits and best options out there in the market for the users to purchase. When the focus is more on education than sales, there will be no pressure to buy the EV, users could be more comfortable and take more informed decisions. Overall, these factors would see an upsurge in the purchase of EV.

The impacts of EV innovation centre will be following:

- Overcoming barriers like charging infrastructure and battery issues
- Enhanced features related to EV and charging equipment
- Remove misconceptions upon discussion with experts
- Providing range of financing options to potential buyers
- Attitude and general perception towards EV will be more positive
- Intention to recommend and purchase will increase

After experiencing an EV, certain factors should become low barrier for EV adoption like – charging duration and infrastructure, battery issues and low noise level. Giving potential EV consumers the opportunity to test an EV at the EV innovation



Giving potential EV consumers the opportunity to test an EV at the EV innovation centre might be a promising means for supporting EV acceptance, and thereby, the expansion of the EV market.

centre might be a promising means for supporting EV acceptance, and thereby, the expansion of the EV market. Direct experience can help to overcome consumers' misconceptions which may be based on older EV models (e.g., slow, strange design, embarrassing). The innovation centre will result in EV drivers' adoption of current EV technology and the real-life experience will have a great impact on the perception and acceptance of EVs.

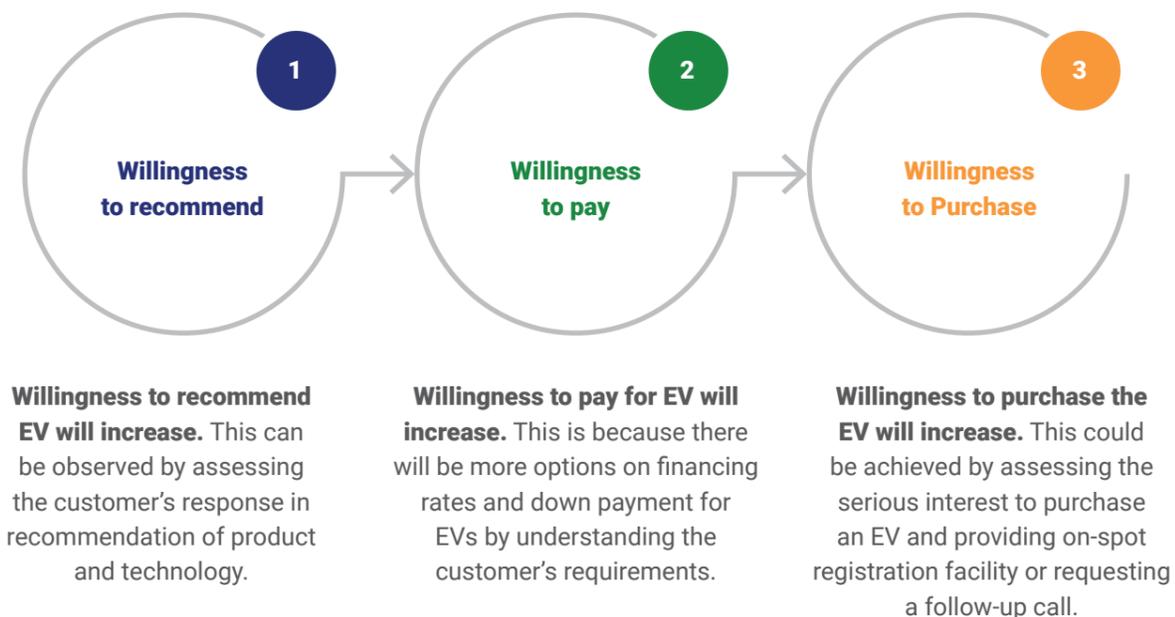
Lastly, to assess impact of Innovation Centre more closely, some key measures that should be taken include reviewing test drives taken along with the recording of visitors, event website traffic, social media likes and Google customer reviews, etc. The visitors list would provide demographic overview and the assessment of impact for different age/gender group would be more evident. The customer review along with their feedback will be a great resource for impact assessment, as well.

Product and Technology Confidence among customers

The innovation centre will provide first-hand opportunities for the users to talk with the EV industry experts along with test driving the electric vehicle. The discussion on battery technology along with incentives and low operating costs will add to the advantage of the adoption of EV. Also, discussions on various products and technology related to electric vehicle equipment as well as charging will act as feedback for the OEMs and CPOs to advance the new upcoming features. This will instill more confidence in the product and technology among the customers.

The list of evident impacts could be categorized into three buckets:

Figure 11 : Impact Measurement Criteria



PM's campaign on LiFE (Lifestyle for Environment)

Prime Minister's campaign on LiFE was introduced during the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow in 2021. The idea promotes an environment-conscious lifestyle that focuses on 'mindful and deliberate utilisation' instead of 'mindless and destructive consumption'. The EV Innovation Centre will help to achieve the campaign goals.

Prime Minister's target is for India to get 50% of its energy from renewable resources by 2030, and by the same year to reduce total projected carbon emissions by one billion tons. Also, by the year 2070, India will achieve the target of Net Zero. To deal with climate challenges and accomplish the targets set forth by honorable Prime Minister, the CO2 emissions needs to be controlled. Based on the urgency and necessity of addressing climate change, electrification of transportation will play



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a critical role in meeting this goal. Adopting to EV will act as a behavior change that will be aimed at individuals as well as communities to adopt climate friendly mode in transport sector. The setting of new infrastructure for electric vehicle would also require more human resources. This would create livelihood options for communities as more jobs would be created by shifting towards clean energy transport.

The innovation centre takes examples from international, national as well as local best practices to feasibly scale up the adoption of EV. The significance of zero emissions caused due to electric

vehicle would be a highlight in the innovation centre and users can relate more to clean energy. This would in fact promote a healthy lifestyle and faster adoption to EV. India has demonstrated leadership in unique individual-led programs to address climate change, such as Swachh Bharat Mission, GOBARDhan Scheme and 'Give It Up' Campaign. The innovation centre will boost the awareness and adoption of EV amongst the users which will play a vital role for the LiFE campaign, since LiFE is a public movement to mobilize individuals to become 'pro-planet people'



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Conclusion

With the increasing number of vehicles on the roads leading to increased pollution, Electric Mobility is one of the key focus areas for the country. To achieve target electrification of 70 percent for commercial cars, 30 percent for private cars, 40 percent for buses, and 80 percent for two and three-wheelers by 2030, it is necessary that EV adoption becomes rapid and widely accepted among all sections of the population.

Early adopters of EVs are usually well-educated customers with higher income and are predisposed to environment friendly technologies. But regular customers with average purchasing power are critical to the mass adoption of electric vehicles. While the wealthy customers may be willing to purchase electric vehicles without hesitation, the common individual requires physical experience with the vehicle and expert advice to feel confident in their purchase and overcome barriers such as limited awareness. Therefore, education and awareness are strongly linked with accelerating mass adoption of electric vehicles and achieving EV penetration targets.

The innovation centre is an innovative, effective and sustainable solution for promoting brand neutral, unbiased facility dedicated to providing free, non-technical' education and information on EV technologies and encourage EV uptake among all sections of the population.

At innovation centres, the prospective customers would be allowed to test drive the latest models of EVs. These innovation centres will thus act as catalysts to mass adoption by enabling the customers to make informed decision about buying an EV based on their choices and preferences. Additionally, it will help address the fact that longer customer consideration period is required for EV adoption and that a standard non-educational sales-led approach by OEMs in targeting potential new EV customers is not suited to this.

Providing a look and feel check through centres of this kind, accompanied by training materials, exhibits, and expert guidance has already found success in countries such as Canada, Scotland, and England. Innovation centres across other sectors

(agriculture, solar, etc.) have also demonstrated their effectiveness in introducing unfamiliar technology. Active participation of stakeholders in this initiative becomes of utmost importance for effective implementation of such a centre. City, State, and Central agencies would assist in setting up these centres, for example by leasing out the required space, while OEMs and Charging Point Operators would partner up to provide vehicles and charging equipment for the centre to present. Administrative structure would depend on which stakeholder leads the operations of the centre (OEMs, NGOs, PPP, etc.). Collaboration with NGOs can also be done to set up events and auto festivals for customer outreach.

The innovation centres will be made sustainable in long term by generating revenue. Revenue streams could consist of regular partnership fees from OEMs and CPOs, one-time fees for non-partner OEMs and CPOs, workshop sponsorships, and training programs. The exact business model would be decided based on local needs after consultations with several stakeholders

An innovation centre will lead to a series of positive impacts, including increased confidence among customers and thus become catalysts in increasing adoption of electric vehicles. The impact generated by these centres would consist of the following

- Increased EV registration and overcoming barriers to adoption
- Increased product and technology confidence among customers, higher willingness to pay and recommend EVs to others
- Alignment with PM's campaign on LiFE (Lifestyle for Environment) for mindful and deliberate utilization of resources rather than mindless consumption.

Overall, these centres would contribute well to the nation's Electric Mobility ambitions and work closely with customers to increase awareness and understand and meet their requirements.

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