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EUROPEAN ASSESSMENT OF GLOBAL PUBLICLY FUNDED AUTOMOTIVE RESEARCH

Publicly funded automotive research in India



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1 Introduction

1.1 Background

The FP7 project EAGAR benchmarks the current public automotive vehicle research activities at international level, in particular the European Union with Brazil, Canada, China, India, Japan, Malaysia, Russia, South Korea, the United States and 13 EU Member States. EAGAR identifies the national road transport visions and roadmaps, research priorities, supported key topics, technology pathway, as well as the level of investment. This enables a direct comparison of national automotive R&D policies relating to the environment, safety and congestion. The EAGAR study provides a key perspective on global investments designed to improve automotive vehicle technologies for a greener, safer and smarter road transport system.

1.2 Objectives

This report summarises the situation of the RTD funding system in India with respect to published vision statements, research targets and roadmaps, the national funding programmes of the past 4 years. And the report is basis for the subsequent benchmarking analysis, which delivers the key results of EAGAR addressing the following issues:

- Overview of national road transport visions, research agendas and roadmaps
- Comparison of automotive research priorities and investments focused on vehicle technologies, namely passenger cars, commercial vehicles and motorised two-wheelers.
- Characteristics of national automotive research funding systems and approaches
- Potential international cooperation areas from a European perspective

This study benefits the competitiveness of Europe and enables the stakeholders to adjust its visions & plans for the future. Date of publication: September 2010. It is available from the EAGAR website WWW.EAGAR.EU

1.3 Methodologies

This country report is based on comprehensive investigations via desk research, information from the responsible programme managers and individual feedback from experienced project managers and researchers. The methodology used was developed in the first months of the project. It is consistent for all target countries. The data collection was mainly done from May to November 2009. The four main categories are:

- General and automotive data about the country
- Published challenges, visions, targets for automotive research
- Funding organisations and hierarchies for automotive research
- National public funding programmes with dedicated calls or permanently open between in the years 2006 to 2009.

Disclaimer: This document presents quantitative and qualitative data from various sources. Due to the complexity of the project and the large amount of sources of data, regularly changing during the duration of the project, it was not possible to thoroughly validate all details. The EAGAR project partners cannot guarantee that the data presented is either complete or correct. The value of some of these data is mainly explorative, as a first step in an indicators development process. In conclusion, the data provided here may be difficult to interpret, are not exhaustive and may need further development. Comments by stakeholders on the coverage, relevance and interpretation of the indicators provided, as well as observations on new indicators that could be employed to improve the analysis of publicly funded automotive research are welcomed by the EAGAR project consortium. Any quotation of the data in this document should make reference to the above disclaimer. The EAGAR project partners and EC accept no liability for any issues that arise from actions that may be taken as a result of reading this report.

2 Description of the main WP results

2.1 General Information and Automotive Data



India is located in southern Asia, bordering the Arabian Sea and the Bay of Bengal, between Burma and Pakistan. India is the world's 7th largest country, covering an area of 3,287,263 sq km, including land area of 2,973,193 sq km and water area 314,070 sq km. India has the 2nd largest population of the world, 1,166,079,217 people (July 2009). The urban population is 29% of the total population (2008). The total GDP (PPP) estimated for 2009 is 3.548 trillion US dollars [1].

The role and importance of road transport in India and significance of domestic automotive industry

Today India is the world's largest manufacturer of tractors, the second largest manufacturer of two wheelers and fifth largest manufacturer of commercial vehicles. India also has the fourth largest passenger car market in Asia. The number of passenger cars per thousand inhabitants is 8 (estimated in 2008)[2], with 7.8 million sales or new registered 2-wheelers, 1.5 million sales or new registered passenger cars and nearly half a million commercial vehicles annually for 2008-09[3].

The automotive industry is on the fast track, and it has already attained a turnover of 202,000 crore (crore = 10 million, common unit used for Indian currency) Rupee (abbreviated in Rs.), and provides direct and indirect employment to over 13.1 million people. The industry contributes 17% to the total indirect taxes of the Government [4]. (1 Rupee = 0.0154 Euro, 2008-09)

Furthermore, the 2006-2016 Automobile Mission Plan set out the goal to establish India as the destination of choice in the world for design and manufacture of automobiles and auto components. The Plan target is to reach output levels of USD 145 billion, which would account for more than 10% of the national GDP and provide additional employment to 25 million people by 2016 [5].

Tata Motors Limited is India's largest automobile company, with consolidated revenues of Rs. 70,938.85 crores (1Rs = 0.0154 Euro) in 2008-09. The company is the world's fourth largest truck manufacturer, and the world's second largest bus manufacturer. Tata Motors has also emerged as an international automobile company, through subsidiaries and associate companies operated in the UK, South Korea, Thailand and Spain. Among them, Jaguar and Land Rover, two

[1] World Fact Book, 2009

[2] E&T, 2008

[3] SIAM, 2009

[4] DHI, 2009

[5] DHI, 2006

iconic British brands, were acquired in 2008. The Tata Nano, priced at Rs. 100,000 (excluding VAT and transportation cost), was launched in India in 2009. [6]

Besides local OEMs like TATA Motors Ltd, Mahindra Groups, Ashok Leyland Ltd and Bajaj Auto Ltd, there are many Joint Ventures with foreign OEMs, like BMW India Pvt Ltd, Cummins India Ltd, Ford India Pvt Ltd, Hyundai motor India, etc.

National spending and funding for research and technological development (general vs. automotive sector)

Indian automobile companies still spend a relatively low amount on R&D as a percentage of sales. Most of their efforts are directed towards value engineering, or tweaking existing models to improve performance. Developing new models is expensive. Larger, global companies can absorb the costs at lower risk. Indian firms are becoming more ambitious, realising they should be developing new models too. Most of the two-wheeler companies have obtained their basic R&D from their global partners, with whom they have or had technical collaboration, and then customized models for local customers.

In January 2007, the Indian government announced plans to double the country's R&D spending over the next five years, from 1% to 2% of GDP. It follows the previous year's 16% increase in India's science and technology budget [7].

Overseas investments in India have more than doubled in the past five years, with 25% of Foreign Direct Investment directed to R&D. A research scientist in India costs around a third of one in Europe and the Indian government is encouraging international collaboration. There are over 300 Universities and 45,000 Colleges of various types in the country and many are reported to be of a standard to provide quality R&D services.

2.2 National Funding Organisations and Hierarchies for Automotive Research

The structure and governance of the national funding system

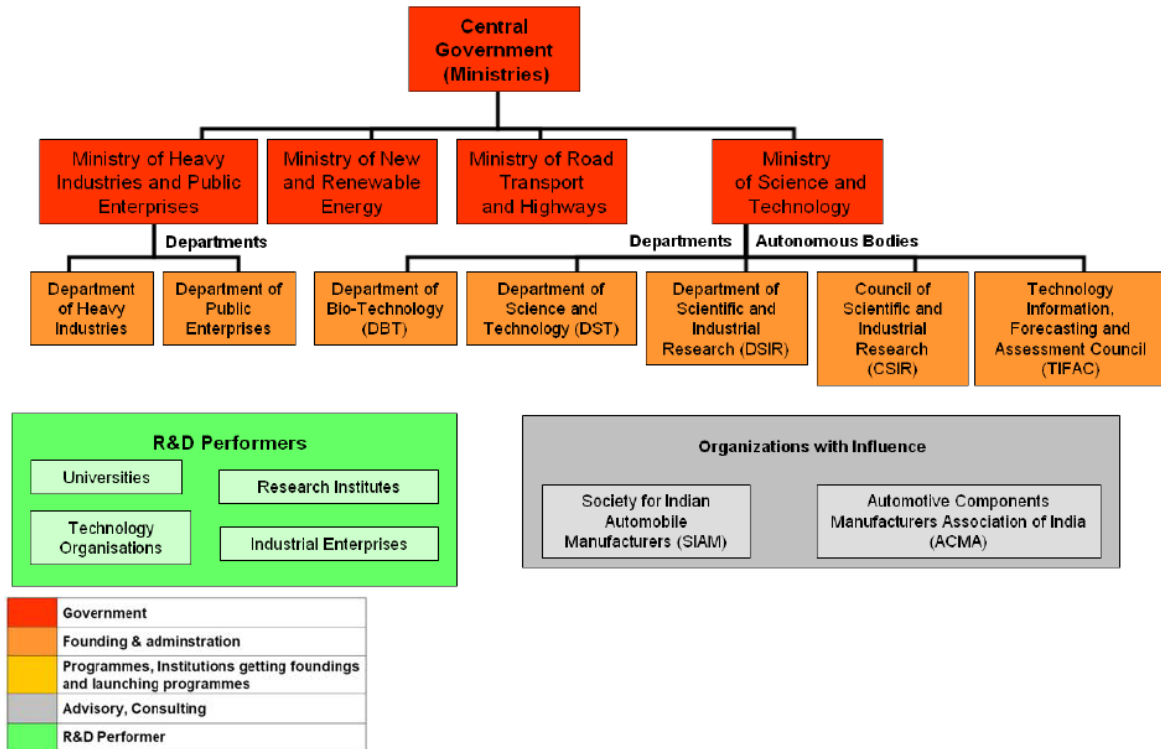
The structure is rather centralised. Most programmes are promoted and controlled by one government organization or department. A hierarchical structure of the funding system in India is provided in the diagram below [8]:

[6] Tata, 2009

[7] Indian R&D, 2008

[8] GOI, 2009

EAGAR – Publicly funded automotive research in India



Funding organisations and key players

The key players of the funding organisation are listed below:

The **Ministry of Heavy Industry & Public Enterprises** comprises of the Department of Heavy Industries and the Department of Public Enterprises.

-The **Department of Heavy Industries** (<http://www.dhi.nic.in>) administers 48 Central Public Sector Enterprises and assists them in their effort to improve capacity utilisation and increase profitability. It also generates resources and re-orientes strategies to help Indian industry become more competitive.

- The **Department of Public Enterprises** serves as an interface between Public Sector Enterprises and other agencies for long term policy formulation and encourages restructuring of Public Sector Enterprises to make their operations competitive and viable on a long term and sustainable basis.

The **Ministry of Science and Technology** comprises of the Department of Bio-Technology, the Department of Science and Technology, the Department of Scientific and Industrial Research, the Council of Scientific and Industrial Research, and the Technology Information, Forecasting and Assessment Council.

-The **Department of Scientific & Industrial Research (DSIR)** (<http://www.dsir.gov.in>) promotes industry lead R&D and supports a large cross section of small and medium industrial units. DSIR encourages the development of state-of-the art, globally competitive, technologies with high commercial potential and acts to catalyse faster transition from lab-scale R&D to commercial products. DSIR seeks to increase the share of technology intensive exports in India’s overall export market; to strengthen industrial consultancy and technology management capabilities, and to establish user friendly information network for facilitating scientific and industrial research in the country. It also provides a link between scientific laboratories and industrial establishments for

technology transfer through the National Research Development Corporation (NRDC) and facilitates investment in R&D through Central Electronics Limited (CEL).

-The **Department of Science and Technology (DST)** (<http://dst.gov.in>) plays a pivotal role in the promotion of science and technology in the country. The department's activities range from promoting high-end basic research and development of cutting edge technologies, to developing the skills of the people delivery these technologies.

-The **Technology Information, Forecasting & Assessment Council (TIFAC)** (<http://www.tifac.org.in>) is an autonomous organisation under the Department of Science and Technology. It was established with the following objectives: undertake technology assessment and forecasting studies in selected areas of national economy, watch global trends and formulation of preferred options for India, promotion of key technologies, and provide information on technologies.

-The **Council of Scientific & Industrial Research (CSIR)** (<http://www.csir.res.in>) is an autonomous body registered under the Registration of Societies Act of 1860. CSIR aims to provide industrial competitiveness, social welfare, a strong science and technology base for strategic sectors and advancement of fundamental knowledge. It aims to provide scientific industrial R&D that maximises the economic, environmental and societal benefits for the people of India.

The Science and Engineering Research Council (<http://www.serc-dst.org>) was established in 1974 and is an apex body through which the Department of Science and Technology (DST), Government of India promotes R&D programmes in newly emerging and challenging areas of science and engineering. SERC is composed of eminent scientists and technologists drawn from various universities, national laboratories and industry. This Council is assisted by Programme Advisory Committees (PACs) in various disciplines of Science & Engineering.

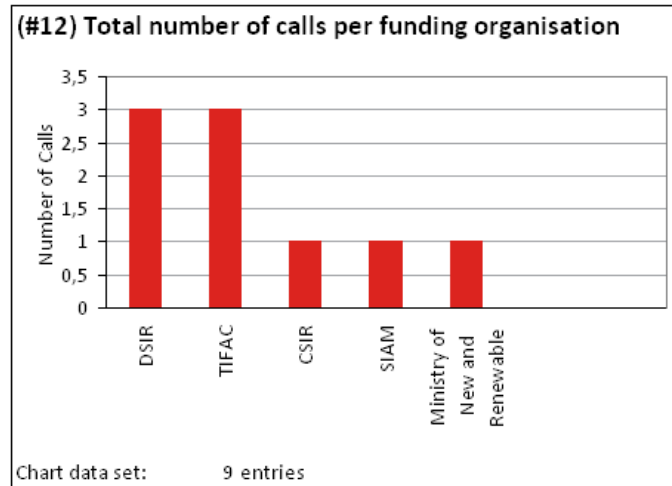
Ministry of Road Transport & Highways (MoRT&H) (<http://morth.nic.in>)

An apex organisation under the Central Government, MoRT&H is entrusted with the task of formulating and administering (in consultation with other Central Ministries/Departments, State Governments/UT Administrations, organisations and individuals) policies for Road Transport, National Highways and Transport Research with a view to increasing the mobility and efficiency of the road transport system in the country.

Ministry of New and Renewable Energy (<http://mnes.nic.in/>)

The aim of the Ministry of New and Renewable Energy is to develop new and renewable energy technologies, processes, materials, components, sub-systems, products and services. These should be on a par with international specifications, standards and performance parameters in order to make the country a net foreign exchange earner in the sector and to deploy such indigenously developed and/or manufactured products and services in furtherance of the national goal of energy security.

The chart below shows the number of programme calls per funding organisation. It should be noted that a few programmes are funded by more than one organisation.



Other organizations with influence on automotive RTD activities in India are:

- **Society for Indian Automobile Manufacturers (SIAM)**

SIAM is the apex Industry body representing more than 40 leading vehicle and vehicular engine manufacturers in India, for instance, Mahindra & Mahindra Ltd, Tata Motors Ltd, BMW India Pvt Ltd, etc. SIAM is an important channel of communication for the Automobile Industry with the Government, National and International organisations. The Society works closely within all the concerned stake holders and actively participates in formulation of rules, regulations and policies related to the Automobile Industry.

- **Automotive Components manufacturers Association of India (ACMA)**

ACMA is the nodal agency for the Indian Auto Component Industry. Its active involvement in trade promotion, technology up-gradation, quality enhancement and collection and dissemination of information has made it a vital catalyst for this industry's development. ACMA is represented on a number of panels, committees and councils of the Government of India through which it helps in the formulation of policies pertaining to the Indian automotive industry. ACMA represents over 558 companies.

- **Automotive Research Association of India (ARAI)**

ARAI has been playing a crucial role in assuring safe, less polluting and more efficient vehicles. It provides technical expertise in R&D, testing, certification, homologation and framing of vehicle regulations. ARAI is a co-operative industrial research association established by the automotive industry with the Ministry of Industries of India.

2.3 Automotive Visions and Strategic Research Agendas

Significant challenges for the national road transport sector.

The significant challenges for India are competitiveness, mobility and climate change.

Competitiveness

The future challenges for the Indian automobile industry are:

- To develop a supply base with emphasis on lower costs and economies of scale
- To develop the technical skills of the workforce
- To overcome infrastructure bottlenecks
- To stimulate domestic demand
- To exploit export and international business opportunities

This will lead to improving India's competitiveness in manufacturing. Systemic deficiencies could be overcome through a long-term and stable policy regime that will support the industry to fulfil its' potential.

Mobility

Many of India's roads are frequently congested and are of poor quality. Lane capacity is low - most national highways are two lanes or less. A quarter of all India's highways are congested, reducing truck and bus speeds to 30-40 km/h. Road maintenance remains significantly under-funded - only one-third of maintenance needs are met. This leads to the deterioration of roads and high transport costs for users.

Rural areas have poor access. Road networks are significant for the development of rural areas, home to almost 70% of India's population. Although the rural road network is extensive, some 40% of India's villages do not have access to all-weather roads and remain cut off during the monsoon season. The problem is more acute in India's northern and north eastern states, which are poorly linked to the country's major economic centres.

India's urban centres are severely congested. In Mumbai and other metropolitan areas, roads are often severely congested during the rush hours. The dramatic growth in vehicle ownership (15% per year) has reduced rush hour speeds to 5-10 km/h in the central areas of major cities.

Climate Change

India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change. This threat emanates from accumulated greenhouse gas emissions in the atmosphere, anthropogenically generated through long-term and intensive industrial growth and high consumption lifestyles in developed countries.

An Expert Committee on Impact of Climate Change set up by the Ministry of Environment & Forests in June 2007 assessed the impact of climate change on six areas, namely water resources, agriculture, Natural Eco-system, Health, Coastal Zone Management and Climate modelling.

Visions & focused targets for road transport

Autopolicy 2002, announced by the Society for Indian Automobile Manufacturers, sought to establish a globally competitive automotive industry in India and to double its contribution to the economy by 2010.

The **Automotive Mission Plan 2016** is for India to emerge as the destination of choice in the world for design and manufacture of automobiles and auto components with output reaching a level equivalent to more than 10% of the national GDP and providing additional employment to 25 million people by 2016.

The **National Action Plan on Climate Change** was released in June 2008. It outlines the national strategy for meeting the challenge of climate change.

The **Technology Vision 2020** provides directions for national initiatives in Science & Technology and provides a strong basis for a policy framework not only for investment but also for the development of an integrated science and technology policy both at the state(s) and national levels.

An outline of India's main targets for the automotive sector is provided in the table below:

Target	Corresponding Challenge	Description including addressed research themes and technologies	Due Year
Emission Regulations	Pollution & Noise	Environment concerns led to India narrowing the gap with European standards at a rapid pace	2010 & later
Alternative Fuels	Fuel Efficiency & Green House Gas Emission	Alternative fuels, such as hydrogen and biofuels, need to be promoted to ensure the long-term sustainability of the industry. Biofuel: 20% ethanol and biodiesel in transportation fuel by 2017; 20% vehicle use of Hythane by 2020. [9]	2017 2020
Improve automotive industry competitiveness	Competitiveness	Promote a globally competitive industry, emerge as a global source for auto components and improve manufacturing	2020
Overcome road infrastructural bottlenecks	Mobility	To face the mobility challenges: National Highway Development Project, Rural Roads Program, State Roads Projects, Mumbai Urban Transport Project	2012
Alternative propulsion	Fuel Efficiency & Green House Gas Emission	Propulsion technology for use of hybrid vehicles, biofuels and alternate energy	2012
Bus body design	Pollution & Noise	Futuristic Bus Body Design with emphasis on energy conservation and eco friendly material	2012
Transmission	Mobility	Development of appropriate transmission systems suitable for urban driving condition	2012
Fuel Efficiency Standards	Fuel Efficiency & Green House Gas Emission	Plan for fuel economy standards for vehicles announced; to be fully operational in two years	2011
Recycling of vehicles	Pollution & Noise	By 2020 recoverable materials will be annually 1.5 Mio t steel, 180000 t aluminium, 75000 t rubber, 75000 t plastics [10].	2020

2.4 Funding Programmes

The link between vision & targets and funding allocation

In general the stated targets are matched with funding programmes. For instance, the National Automotive Testing and R&D Infrastructure Project (NATRiP), the largest and one of the most significant initiatives in Automotive sector so far, represents a unique joining of hands between the Government of India, a number of State Governments and Indian Automotive Industry to create a state of the art Testing, Validation and R&D infrastructure in the country. It is linked to “Create state-of-the-art research and testing infrastructure to drive India into the future of global automotive excellence”, which aims to raise the competitiveness of the Indian automotive industry.

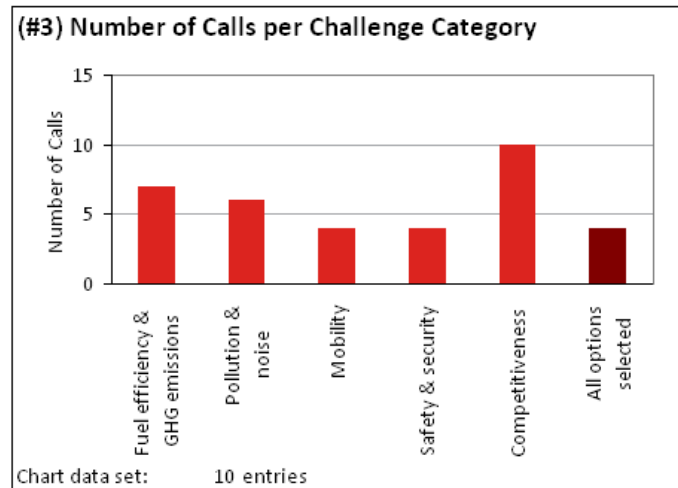
Funding programmes and states of RTD as well as different types of instruments

[9] Green Car Congress, 2008

[10] Government India, 2008

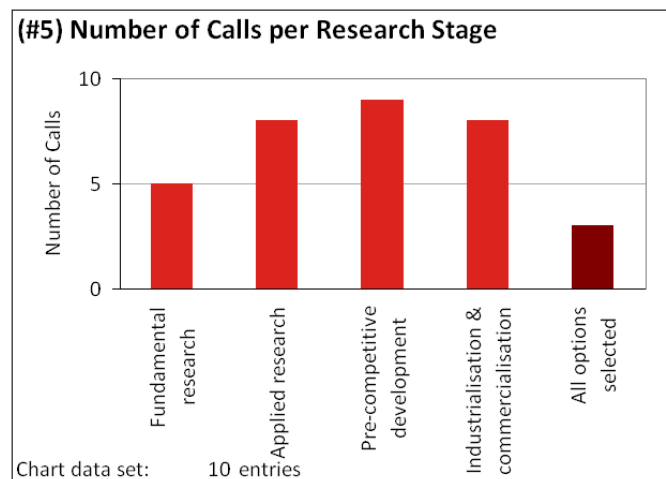
For the Indian funding programmes for automotive RTD, most of them are governed and promoted by the Technology Information, Forecasting & Assessment Council (TIFAC) and the Department of Scientific & Industrial Research (DSIR). Both of these organisations belong to the Ministry of Science and Technology.

This study identified ten RTD funding programmes in India, between 2006 and 2009, which are relevant for the automotive sector. These RTD programmes covered a board cross-section of challenge categories, as illustrated in the chart below. It should be noted that a programme call could be relevant for more than one challenge category.



Most programmes were made for collaborative initiatives, or at least for both collaborative and single partnerships, and the call windows were permanently open.

Many programmes were aimed at the pre-competitive development and industrialisation & commercialisation stages of research (see chart below). Fundamental research is mainly conducted by universities and research and technology organisations (RTOs).



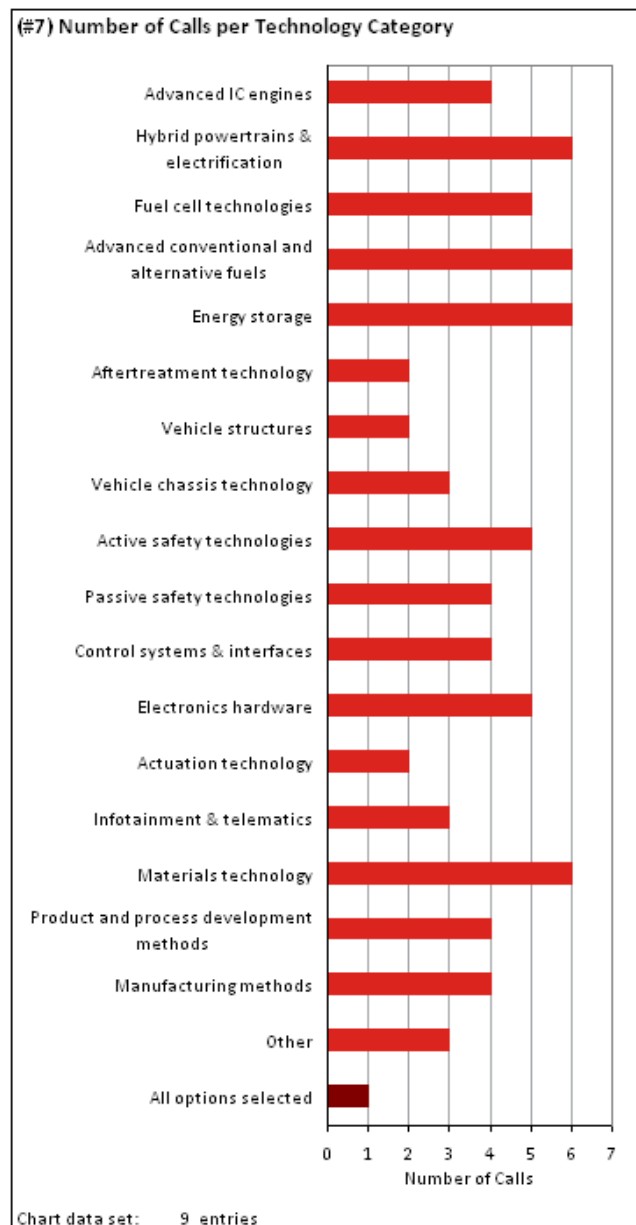
Unfortunately it was difficult to obtain detailed information about the specific programmes such as call frequency, flexibility, duration, investments, and the openness of the programmes to foreign organisations.

For the funding programmes budget information, the data is only available from several programmes, as for most of the programmes, no budget information is indicated. And among the

collected budget information during this study, 7,000 million Rupees are directly related to EAGAR projects, but without any year specified.

Overview of technology specific programmes for automotive RTD

An overview of the numbers of programme calls per automotive technology category between 2006 and 2009 is presented below. Analysed calls were categorised using the research topics relevant for EAGAR. These topics were predefined by the EAGAR project partners. It should be noted that a programme call may be relevant to more than one technology topic category. Programme calls that are not technology specific, and therefore open to any technology category, have been classified as “all options selected”.



Technology topics such as alternative propulsion systems with hybrid powertrain & electrification, advanced conventional and alternative fuels, energy storage, and materials technology are the most popular ones.

For more information, see Section 5 [Annex](#), for the list of programme calls analysed in this study.

2.5 The efficiency, flexibility, and experienced bureaucracy of the funding process

As mentioned above, it was difficult to obtain information about the programme call frequency, flexibility, duration and other details.

The Indian Government considers the automotive industry as an important element of the rapidly developing economy. Therefore the future flexibility to release new programmes in response to changing situations is likely to be relatively good.

Less information is available to describe the application process of the funding program and the implementation method.

Only for some certain funding programm, like the Technopreneurs Promotion Programme (TePP), there is a specified process for applicants to provide feedback: It is required that annual reports of the progress of technical and physical work content of the project as well as Statements of Accounts duly audited by a Chartered Accountant, should be sent to the DSIR annually. Also the audited annual statements of accounts of the project along with utilization certificate have to be provided. [11]

Transparency & openness

Programme information on topics and targets for completed, on-going and new projects are available, but the results of the projects are not published. Most of the information collected in this report was from desk research of public domain data, such as organisation websites.

The existance of an independent review panel for each programme of projects is not known.

Foreign collaboration

Two programme calls were identified that were open for international collaboration; the NATRIP provides business opportunities for foreign companies to establish the required infrastructure, and the International Technology Transfer Programme (ITTP) promoting transfer of technologies, projects and services from India with a view to enhance the reach of Indian industry beyond the national boundaries as well as promoting transfer of technologies from other countries to India with a view to enhance the technology export capability of Indian industry. The other eight calls were not specified for foreign collaboration.

[11] DSIR, 2009

3 Discussion and Conclusion

The data about publicly funded automotive R&Ds in India as presented in this report was mainly collected from online research and local contacts. Further information required to reach a more detailed report, for instance, the program/project budgets, the program running details, is limited. And this is the main uncertainty of the findings for India.

However, the desk research still leads to a general view of the India R&D policy and R&D programs where statistical data or specific information is missing. And the available information on the considered programs does allow an analysis of the India policy, identifying trends as well as benchmarking with other economies and provide a global picture of the R&D policy in India.

In order to achieve the significant challenges for India automotive industry as to raise the worldwide competitiveness, increase the mobility and face the climate change, the India government has announced several national plans, like “The Automotive Mission Plan 2016”, set specified targets and implemented related RTD programs.

Total ten national funding programs have been identified and analysed. The funding structure is rather centralised as most of them are promoted and controlled by one government organization or department. They focus mostly on powertrain research and energy storage for future vehicles such as hybrids and fuel cells, and also stress the improvement either for product and process development or for manufacturing in order to raise the competitiveness. Most of the programs are general, long-term and permanently open which include a broad possibility of related topics.

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5 Annex

Overall programme initiative name	Programme call name	Programme call description	Funding organisation	Call end date	Main point of reference
National Automotive Testing and R&D Infrastructure Project	NATRIP	NATRIP aims to set up of 7 state-of-the-art automotive testing and R&D centres across the country and thereby : i. Create core global competencies; ii. Enhance competitive skills for product development leading to deepening of manufacturing; iii. Synergize Indian unique capabilities in information technology with the automotive sector; iv. Facilitate seamless integration of Indian automotive industry with the world to put India strongly on the global automotive map.	Government of India and Industry Association	Sep 2011 (facilities to be completed)	http://www.natrip.in
Technology Vision 2020	Collaborative Automotive R&D	The vision is to enhance energy security, environmental quality, and economic growth and establish a globally competitive transportation industry in India. Consultations were held with automobile manufacturers, Component manufacturers, senior academics and government departments. Representations from other industry segments are invited for CAR meetings.	Technology Information, Forecasting and Assessment Council (TIFAC)	Not Specified	http://www.tifac.org.in/index.php?option=com_content&view=article&id=68&Itemid=99
Technology Vision 2020	SME-Technological Upgradation Programme	In 2006 TIFAC initiated this programme aiming at providing R&D and Technical support to select clusters of MSMEs (Micro, Small and Medium Enterprises) through an approach based on establishing and leveraging academia-industry interaction. The approach starts with a comprehensive assessment of the technology needs and gaps of the cluster followed by the design and implementation of targeted technical interventions for the particular cluster by the academic / R&D institutions. The interventions include product / process technology improvement, testing and quality issues, and training / capacity building.	TIFAC	Not Specified	http://www.tifac.org.in/index.php?option=com_content&view=article&id=69&Itemid=557

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Overall programme initiative name	Programme call name	Programme call description	Funding organisation	Call end date	Main point of reference
Technology Vision 2020	Bioprocess & Bioproducts Programme	Programme was launched in January 2007. While catalyzing technology development activities in the field of bio-products and bio-processes, this programme aims to focus on the following: Identification of technologies with far reaching social, economic & commercial consequences; Development & demonstration of select technologies in pre-treatment, processing and conversion of biomass to produce fuels, chemicals and other value-added products; Promotion of technology capabilities to reaching out to the wider cross-section of stake holders in the national & international arena.	TIFAC	Not Specified	http://www.tifac.org.in/index.php?option=com_content&view=article&id=65&Itemid=553
The New Millennium Indian Technology Leadership Initiative	NMITLI	NMITLI is the largest public-private-partnership effort within the R&D domain in the country. It looks beyond today's technology and thus seeks to build, capture and retain for India a leadership position by synergising the best competencies of publicly funded R&D institutions, academia and private industry.	Council of Science & Industrial Research (CSIR)	Not Specified	http://www.csir.res.in/external/Heads/collaborations/Nmitli.htm
Technology Promotion, Development and Utilization Programme	Technopreneurs Promotion Programme (TePP)	Objective: - To promote and support untapped creativity of individual innovators; - To assist the individual innovators to become technology based entrepreneurs; - To assist the technopreneur in networking and forge linkages with other constituents of the innovation chain for commercialization of their developments.	Department of Scientific & Industrial Research (DSIR)	Not Specified	http://www.dsir.gov.in/tpdup/tepp/tepp.htm
Technology Promotion, Development and Utilization Programme	Technology Development and Demonstration Program (TDDP)	To promote industry's efforts in development and demonstration of indigenous technologies, development of capital goods and absorption of imported technologies Objectives (a) Development of need-based technologies; (b) Strengthening the interface between industry, R&D establishments and academic institutions	Department of Scientific & Industrial Research (DSIR)	Not Specified	http://www.dsir.gov.in/tpdup/tddp/tddp.htm

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Overall programme initiative name	Programme call name	Programme call description	Funding organisation	Call end date	Main point of reference
Technology Promotion, Development and Utilization Programme	International Technology Transfer Programme (ITTP)	<p>To promote transfer of technologies, projects and services from India beyond the national boundaries as well as promoting transfer of technologies from other countries to India.</p> <p>Activities:</p> <ul style="list-style-type: none"> - compile information on exportable technologies and technology intensive projects, products & services available with Indian industry and R&D establishments; - create awareness about technology export capabilities among potential foreign buyers or collaborators; - support capability building of industries and R&D establishments for technology intensive exports; - support research and analytical studies aimed at providing inputs to the government for technology exports related policy formulation; - promote and support Institutional Mechanisms for catalyzing international technology transfer and trade; and - facilitate signing agreements on High Technology Cooperation and Trade between Indian and foreign industrial units. 	Department of Scientific & Industrial Research (DSIR)	Not Specified	http://www.dsir.gov.in/tpdup/ittp/ittp.htm
National Hybrid Propulsion Programme	NHHP	<p>The program driven in a phased manner:</p> <p>Phase -1 Technology Demo which would involve system integration and running the vehicles.</p> <p>Phase-2 would be Consolidation and making it feasible</p> <p>Phase -3 would be making it economically viable</p> <p>Key Component Focus : Developing a Sustainable Marketplace</p> <p>Vehicle Focus : Advancing Propulsion Technologies</p> <p>Student Focus : Investing in the Future Workforce</p>	Society for Indian Automobile Manufacturers (SIAM) & Government of India	Not Specified	http://siamindia.com/Upload/circular/1149/NHPP.htm
Research , Design and Technology Development	RD&D	<p>The need to refocus attention on Research, Design & Development (RD&D) in new and renewable energy has arisen. The underlying purpose of RD&D effort is to make industry competitive. The share of indigenously designed, developed and manufactured new and renewable energy systems/ devices has also to increase and be consequently monitored for its eventual growth to a dominant position.</p>	Ministry of New and Renewable Energy	Not Specified	http://mnes.nic.in/