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EUROPEAN ASSESSMENT OF GLOBAL PUBLICLY FUNDED AUTOMOTIVE RESEARCH

Publicly funded automotive research in China

SEVENTH FRAMEWORK PROGRAMME

Acknowledgements

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1 Introduction

1.1 Background

The FP7 project EAGAR benchmarks the current public automotive 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 deliverable report summarises the situation of the RTD funding system in China with respect to published vision statements, research targets and roadmaps, the national funding programmes of the past 4 years and the governance of automotive RTD funding in China.
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
- Characteristics of national automotive research funding systems and approaches
- Highlight areas of strenght and weakness I European RTD compared to the analysed countries
- 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 as deliverable D.5.1.

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

China is one of the biggest countries behind Russia and Canada with 9,596,961km2[1] and stretches some 5,026 kilometers across the East Asian landmass bordering the East China Sea, Korea Bay, Yellow Sea, and South China Sea, between North Korea and Vietnam with various changing landscapes like broad plains, deserts and mountains.

China is also a major player both on a demographic level (more than 1330 million people in 2008) and on an economic level: its GDP was 31 405 billion yuan in 2008[2] (3 075 billion euros), and increasing on the fastest rate in the world. Since 1949 and the Chinese Civil War, China is ruled under a communist policy by the Communist Party of China which sets the rules and laws of the country in a very centralized way.

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

The car market is currently blooming in China. In 2009, China became the first car market in the world, before the US market. Passenger car sales were already close to 9 million units in 2007 even though only 28 inhabitants out of 1000 own a passenger car: the potential market in this country, driven by the demographic parameter is huge. On the other hand, a lot of people own motorized two-wheelers for which sales exceed 25 million units in the year of 2008[3].

Figure:

Number of passenger cars per thousand inhabitants	28		2007
Motorised two-wheeler sales or newly registered p.a.	25944700		2008
Passenger car sales or newly registered p.a.	8790000		2007
Commercial vehicle sales or newly registered p.a.	2490000		2007

Sources: French Association of Carmakers (CCFA), Chinese Association of Automotive Manufacturers (CAAM)

Furthermore, driven by a strong political will, China aims at building a complete and consistent set of transport infrastructure.

[1] Source: CIA, The World Factbook 2009

[2] Source: National Bureau of Statistics

[3] Source: French Association of Carmakers (CCFA), Chinese Association of Automotive Manufacturers (CAAM)

The local Chinese market is addressed by indigenous OEMS and carmakers such as Great Wall Motor, BYD Auto, FAW and SAIC, many of whom manufacture small, light vehicles that are suitable for Chinese consumers and businesses. Those vendors have also been joined on the Chinese market by the big names such as Toyota, Ford and GM. The approach taken by the big global brands has been to establish joint ventures with local vendors. The Chinese Government is keen to promote low-emission vehicles and stimulate automotive manufacturing in its central region, and has provided funding for foreign companies to establish JVs with indigenous vendors. This approach is successful as the market bloomed with a turnover of 87 billion euros and more than 1 600 000 people employed[4].

Figure:

Automotive industry turnover	86984	billion euros	2004
Automotive industry number employed	1605000	people	2004

Source: Ministry of Science and Technology

The industry is growing not just in volume, but also in maturity. The big companies which had settled in China brought their experience and knowledge to their partners and this promotes also the mergence of Chinese carmakers: BAIC is looking to buy Saab and Geely tries to take control of Volvo. China has also developed a large number of research centres and research laboratories in universities, usually developed by partnering with carmakers.

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

China aims at developing strong R&D systems through its universities and its state laboratories. In 2006, China as a whole (all funding sources) spent 300 billion Yuan (approximately 30 billion €) on R&D[5]. This amount of R&D spending is 1% of the country's GDP, which is quite low compared to developed countries where R&D spending can exceed 2.5%. But this situation changes quite fast as the State Council is spending more and more in the domestic RTD. With only 5 billion euros R&D spending in 1997, China increased its R&D spend by a factor of 8 in nine years.

China shows a strong political will with a clear vision of what the future should be made of through its 5-Year plans. It is no surprise that the public RTD spend is almost 25% of the total RTD spend while it might be 10% or less in other countries. The State Council through its ministries supports a lot the industry by spending huge amounts of money to make Chinese R&D one of the most performing in the world.

Figure:

Total RTD spend	3 003,00	100 million yuan	2006
Public total RTD spend	742,00	100 million yuan	2006
Private total RTD spend	2 073	100 million yuan	2006
Foreign total RTD spend	49,00	100 million yuan	2006
Other total RTD spend	138,9	100 million yuan	2006

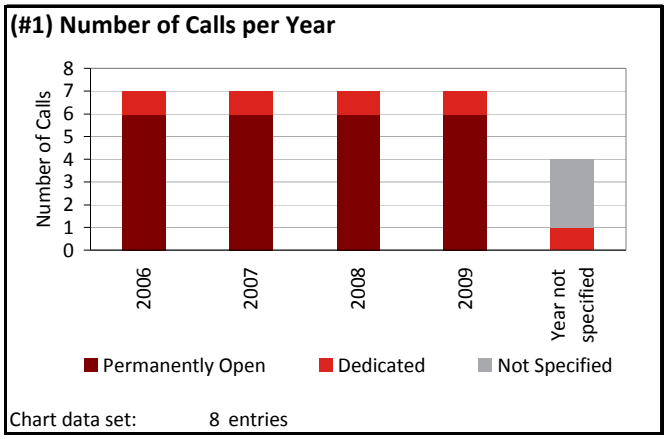
Source: Ministry of Science and Technology

[4] Source: Ministry of Science and Technology

[5] Source: International Organization of Motor Vehicle Manufacturers

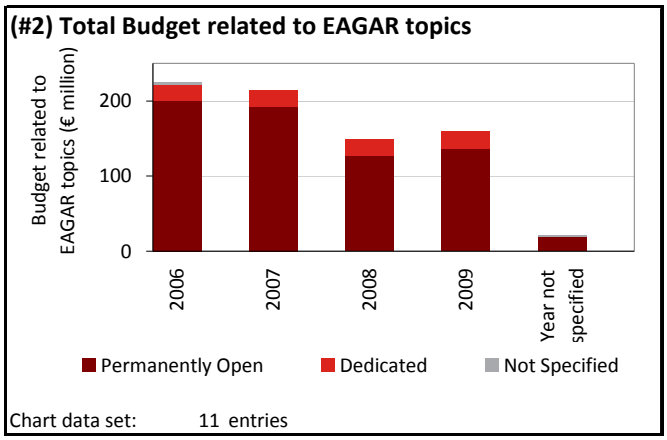
One of the challenges and targets of the Chinese government is to increase significantly its R&D intensity. One of the main targets of the 11th 5-Year plan is to increase the share of R&D spending out of total GDP up from 1.3 percent in 2005 to 2 percent in 2010.

Figure:



Source: EAGAR

Figure:



Source: EAGAR

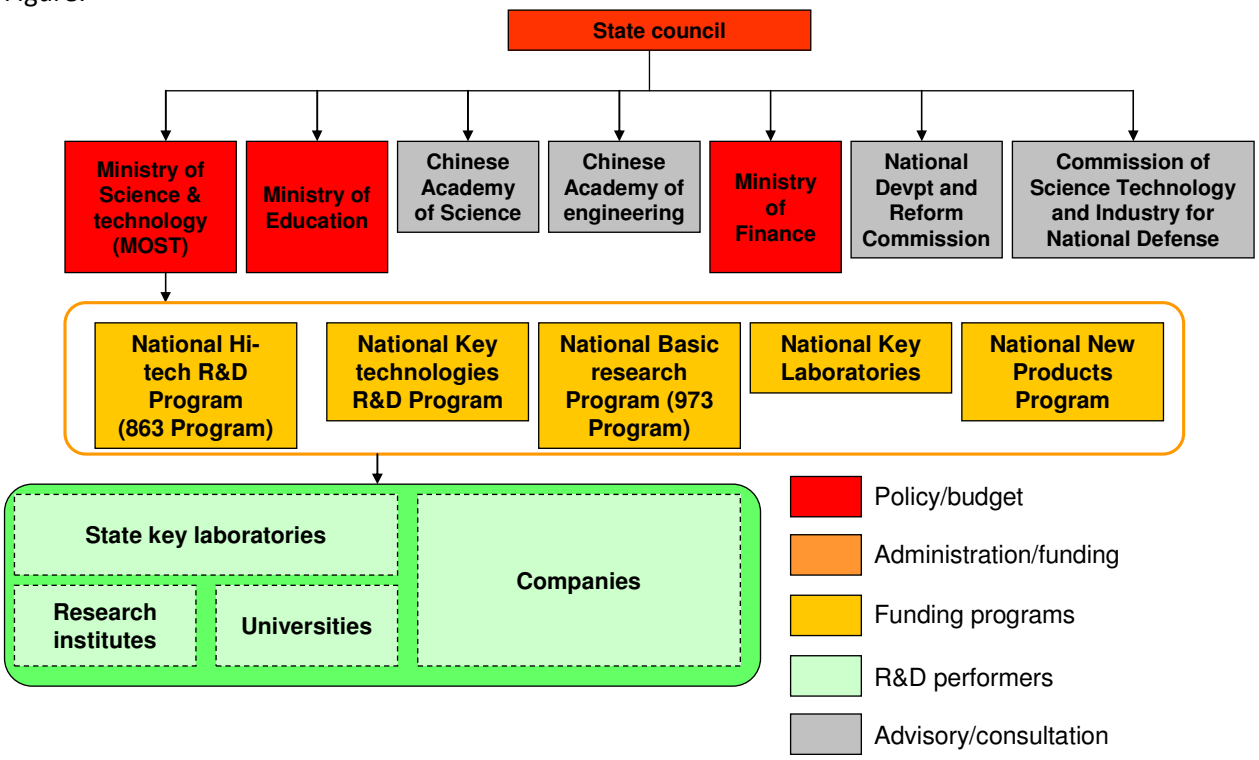
2.2 National Funding Organisations and Hierarchies for Automotive Research

The structure and governance of the national funding system

The R&D organization in China is as follows: highly centralized around the State Council, the ministries have clear, separate objectives. In EAGAR's scope, the Ministry of Science and Technology is the most important state organization. It gives funds to R&D performers such as the state laboratories, the universities and the industry in general. These fundings are made through national programmes created under a 5-Year plan. Some of these programmes are quite old (the 863 programme and the 973 programme were decided in 1986 and 1998 respectively[6]). The Ministry of Education has a role of supporting the MoST when deciding where the money should be spent and evaluating the results. The MoE is also responsible for running the universities which are the most important R&D performers and thus the universities also receive a lot of money from the MoST.

[6] Source: Ministry of Science and Technology

Figure:



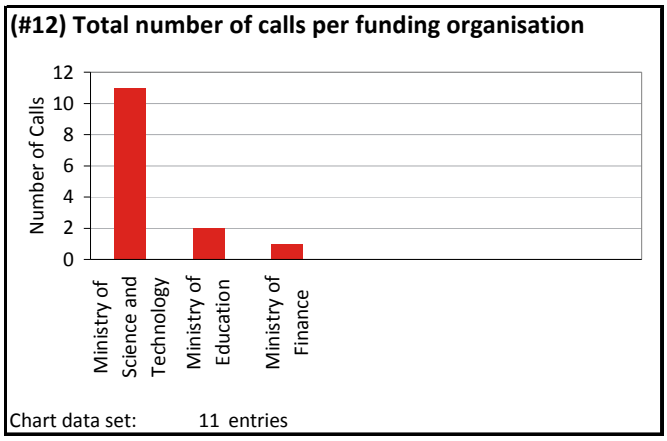
Source: EAGAR

The Chinese R&D organization is strongly centralized as far as funding are concerned.
There is a strong focus on national research laboratories which receive a large number of calls and thus a large amount of public grant to perform R&D but the number of the institutes decreased compared to the past. Whereas in 1991 China had almost 6,000 government research institutes which employed 1,000,000 employees, in 2004 there were less than 4,000 research institutes with approximately 560,000 employees. While the number of government research institutes decreased considerably, however, as a whole the research institute sector continues to receive more funds for R&D than the university sector. For calls, we have a consistent picture where universities and RTOs are almost equally concerned by the calls.

Funding organisations and key players

Ministry of Science and Technology supported by the Ministry of Education are dealing with the funding. The two ministries are directly linked to the State Council which holds the political power in the country and there is no other intermediate below them to distribute the funding to the R&D performers. The Ministry of Finance has also been linked with the funding of a programme but as a general rule it does not seem to be an important player for the funding of automotive R&D.

Figure:



Source: EAGAR

Ministry of Science and Technology	http://www.most.gov.cn
MoST is the major spender of the central government's RMB71.6 billion (7 billion euros) R&D spending for 1995-2005 – perhaps 30% of the total. MoST's S&T budget covers several major programmes. The largest four of these are: National High-tech R&D Programme (863 Programme). National Basic Research Programme of China (973 Programme). National Key Technologies R&D Programme. 16 major programmes 2006-2020	

Ministry of Education (MoE)	http://www.moe.edu.cn/
The Ministry of Education supports research in universities, but does not provide research grant funding. Ministry funds support activities such as key lab development and the hiring of top professors; and part of the general budget allotted to universities by the Ministry can be spent on research. This is normally used for smaller projects, supporting young scientists, and preparing applications to major programmes run by MoST, NDRC and other government bodies. Some prestigious universities– such as Tsinghua, Peking, Fudan and Tongji universities – come directly under the Ministry and appear to enjoy preferential funding status. Other universities are supported by local governments or other ministries.	

Chinese Academy of Sciences (CAS)	http://english.cas.ac.cn/
CAS runs 100 institutes and research centres , some of them are very new across all areas of natural science and engineering. The size of CAS's budget is not routinely published but we know it is considerable: the official Xinhua news agency reported that in 2004 CAS received a total of RMB12.54 billion (1.23 billion euros) of public funding. This included the government's fiscal allotment, grants and funds related to specific facilities and equipment. The money is mainly used by CAS within its own institutes to support key research projects and daily personnel and administration expenses. The CAS President's Fund supports CAS-wide key and special projects. The CAS Innovation Fund supports institute-based innovation activities. Each institute director can dispose of certain special funds (ranging from under one million to several million RMB) to support key studies within the institute. In addition, CAS researchers obtained 14.5 per cent of National Natural Science Foundation of China award funding in 2006 (compared to the 46 per cent awarded to China's universities).	

National Natural Science Foundation of China (NSFC)	http://www.nsfc.gov.cn/Portal0/default106.htm

The NSFC was set up under the State Council in 1986, modeled on research funding agencies such as the US National Science Foundation and the German DFG. It runs competitive application processes open to researchers in any universities and institutes in China.
In 2006, NSFC spent RMB4.46 billion (€446 million), comprising RMB3.62 billion (€362 million) directly from central government and the rest from donations, special funds and international cooperation funds. In 2006, awards from open competitions amounted to RMB2.04 billion (£135.8 million). Another RMB0.65 billion (€65 million) was awarded in competitions restricted to certain regions or to young scientists. There appears to be a trend for NSFC to develop more specified topics for open calls, rather than operating a purely bottom-up process.

The average award to an NSFC project is relatively small: in 2006 it averaged RMB274,000 (€ 27 400). As with all other research funding in China, personnel costs may not be claimed. The award covers only non-personnel direct costs and some institutional indirect costs.

In the next paragraph, we will analyze in details the programmes which allocate money for automotive RTD

Remit for organisations & calls: overlaps or conflicts

This organization does not allow space for overlap as one organization decides (the state council) and another sets the plans into action and funds them (MoST). On an organizational level only, the Chinese R&D seems to be very efficient with a lot of permanently open programmes.

2.3 Automotive Visions and Strategic Research Agendas

Significant challenges for the national road transport sector.

China has a clear vision of how the country should develop in the future. The main vision is the 11th Five-Year Plan which is a series of economic development initiatives, mapping strategies for economic development, setting growth targets, and launching reforms. One plan established for the entire country normally contains detailed economic development guidelines for all its regions. The Eleventh Five-Year Guideline is the plan for the period 2006-2010. It is meant to secure the economic growth and economic structure, to urbanize the population, save energy and national resources, encouraging environmental practices, and improve education.
The MoST also issued an important plan for R&D which is called the "National Medium and Long term Plan for Science and Technology, written in 2006.

Figure:

Vision name	Corresponding challenge	Description	Year

11th five year plan	all of them	The Eleventh Five-Year Plan consists of 15 sections and a total of 48 chapters. The document begins by concluding that during the period of the Tenth Five-Year Plan (2001–2005) China became a significantly stronger nation, people's livelihood had improved notably, and the nation's status in the world had risen considerably. Most importantly, the document reiterates two principles for development—a"concept of scientific development" (kexue fazhan guan) and constructing a "harmonious socialist society".	2006
China Sustainable Develoment Strategy 2009	all of them	The report states that China's measures for developing a low carbon economy include making relevant laws and regulations related to climate change, building long term mechanisms for low-carbon development as well as relevant policies, strengthening cooperation and setting up low carbon technology systems, and establishing a cooperation mechanisms	2009
National Medium and Long term plan for Science and Technology	all of them	The National Medium and Long term plan for Science and Technology reflects China's both determinations, to overcome growing domestic social and environmental problems through technology and to become a world leader in innovation.	2006

Source: EAGAR

Visions & focused targets for road transport (is there some kind of contol, are they realistic and up-to-date)

From these guidelines, the Chinese leaders have drawn several targets for different topics and industries. Concerning EAGAR topics, the main challenges China wants to address are competitiveness and environmental issues. The main objective is to reduce the CO_2 and pollutant emission by 20% by 2020, in a similar way the European Union set its objectives for member states. China wants to comply with this objective while continuing its economic growth (45% GDP increase between 2008 and 2020, this was a pre-financial crisis objective). China is also very proactive on electric vehicles development, with two targets set for this. Technically, the cost of the rechargeable batteries should be reduced to allow EVs to spread, and on the market side, the government decided to support the development of EVs by ordering large fleets of vehicles in order to quickly reach the 500 000 HEVs and EVs target for 2011.

Figure:

Target name	Corresponding challenge	Description including addressed research themes, technologies	By date	Reference	Year of publication

Green growth	Environmental issues competitiveness	20% reduction in energy consumption per unit of GDP and an estimated 45% increase in GDP, each by 2010. Total discharge of major pollutants down to 10 percent in five years. Population up from 1.30756 billion in 2005 to 1.36000 billion in 2010.	2010	11th 5-Year Plan	2006
CO2 emission reduction	Environmental issues	During the 11th Five-Year Plan period, reduce the total emission of major pollutants by 10%. The Chinese Academy of Sciences has released its China Sustainable Development Strategy Report 2009 in which it sets objectives for reaching by 2020. China's low carbon economic development target is set at 40%~60% reduction of energy consumption per unit of GDP over the 2005 level, and CO2 emissions per unit of GDP to be decreasing by about 50%.	2010	Chinese Academy of Sciences	2006
20% by 2020	Environmental issues	China targets the use of 20% of renewable energies in its energy mix.	2020	Commission of Reform and Development	2009
Economy growth	Competitiveness	Annual growth rate of 7.5 percent for the GDP from 2006 to 2010. Per capita GDP increase 6.6 percent annually, from 13,985 yuan in 2005 to 19,270 yuan in 2010.	2010	11th 5-Year Plan	2006
2% RTD spend on GDP		The 11th 5-year plan aims at a share of R&D spending out of total GDP raise from 1.3 percent in 2005 to 2 percent in 2010	2010	11th 5-Year Plan	2006
Electric vehicle production	Competitiveness	China wants to raise its annual production capacity to 500,000 hybrid or all-electric cars and buses by the end of 2011, from 2,100 in 2008	2011	Revitalization Plan	2009

Battery cost reduction	Competitiveness	The cost of the rechargeable battery is lower than ¥2-3 RMB/Wh	unknown	973 Project for Energy Storage System	unknown

Source: EAGAR

These targets look very realistic and achievable for several reasons:

- all are measurable
- they are very recent: 2006 for the oldest ones.
- they have been set for a short-term future (2010) or medium-term future (2020), this would limit the potential gap
- all the targets are linked together in the 11th 5-Year guideline.

2.4 Funding Programmes

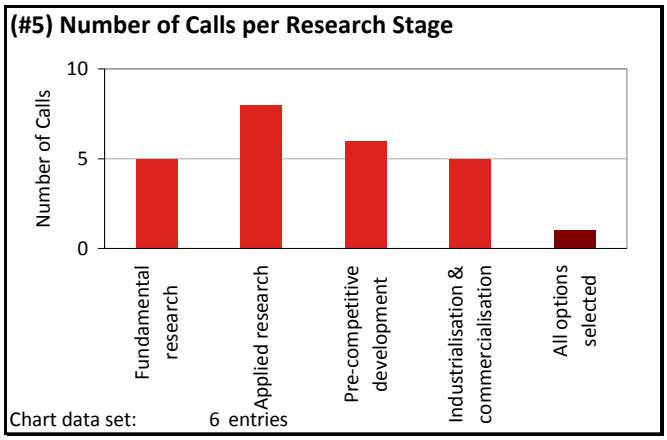
The link between vision & targets and funding allocation

Chinese national programmes are mainly very big programmes which look at various topics from biology to space equipments. But apart from that, we can see a clear pattern between the vision of the 5-Year plans, the targets which are set for the ministries and the state organizations and the funding process. Furthermore, this consistency is even more reinforced by the long term plan for R&D.

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

Chinese RTD is well balanced. All R&D stages are targeted and receive a somewhat equal amount of calls. Maybe we can still note a small emphasis on applied research and more fundamental research compared to what was going on in the past.

Figure:

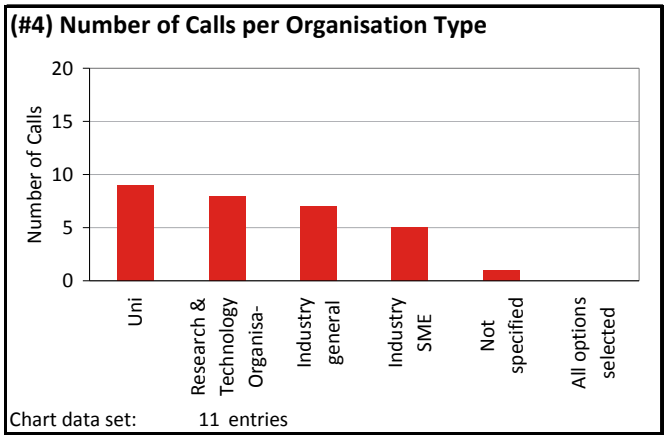


Source: EAGAR

From the information the EAGAR project has retrieved, the project partnership which are set up in the Chinese programmes usually mix between collaborative projects and single partner initiatives giving a consistent set of collaboration between the RTD players.

On the same idea as for the number of calls per research stage, the observation of the number of calls per organisation type shows the light domination of the universities and RTOs over the industrial players.

Figure:

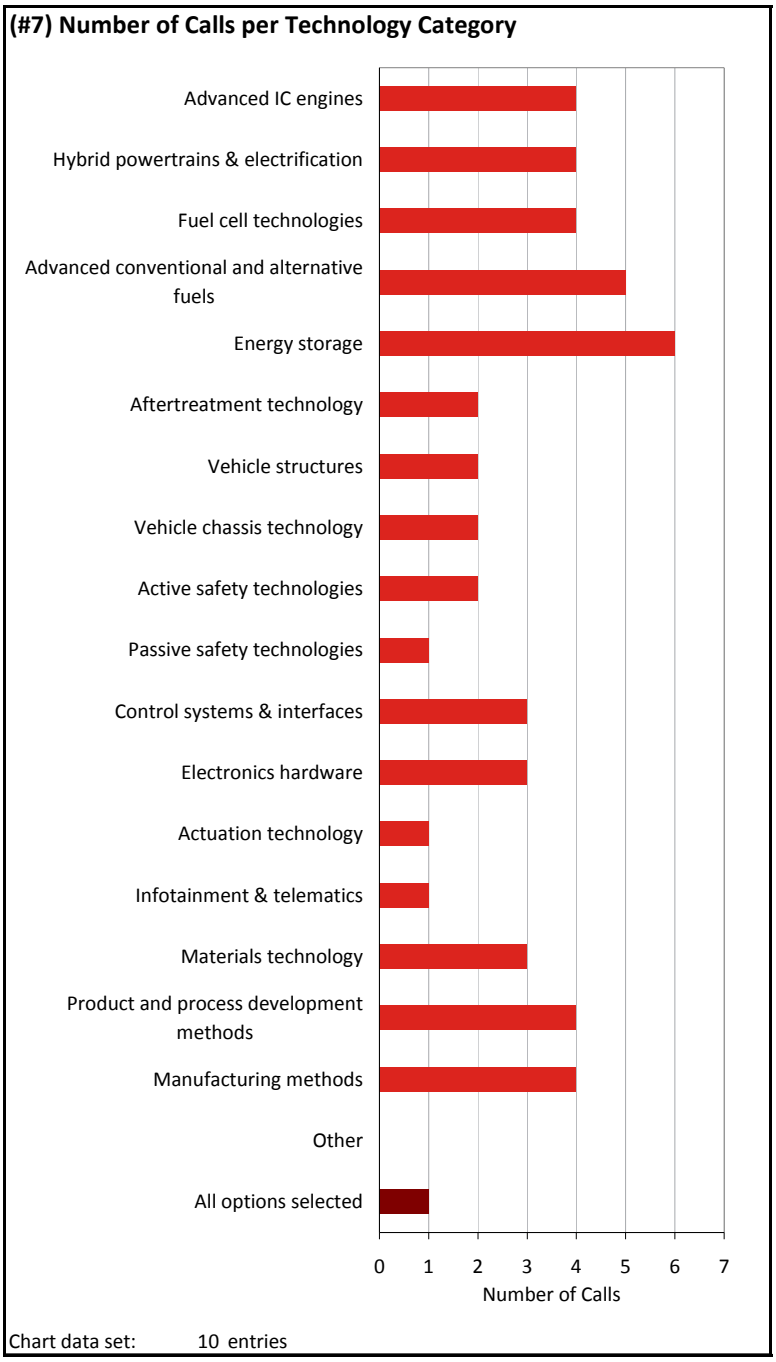


Source: EAGAR

Overview of technology specific programmes for automotive RTD

There is not really dedicated programme for automotive R&D in China. The 5-Year Plans are declined into several big programmes which cover several fields and inside these programmes, some projects can be linked to automotive topics.

The most popular topics across the Chinese programmes are linked with the motorization of vehicles. They deal with advanced IC engines and hybrid powertrains for the short term and with fuel cells for the long term. Linked to these the research on Energy storage and more especially Batteries is the first topic in terms of number of calls and thus in terms of importance. The other axis of interest for the Chinese automotive RTD is on the production of vehicles. "Product and process development methods" as well as "manufacturing methods" are quite important topics in the Chinese programmes.



During the data search process, the funding programmes in China have been identified and analyzed in depth to find more details available to characterize the kind of R&D and the topics they are related with.

EAGAR identified 11 programme calls from 9 distinct initiatives dealing with automotive R&D and based on public funding for a total amount of 769 million euros from 2005 to 2009.

Figure:

Total number of Programme Calls		**11**		
Total number of Programme Initiatives		**9**		
Total number of Funding Organisations		**4**		
Total Budget related to EAGAR projects			**769,10 €**	million
(Based on	11	data entries)		

The two main programmes in China are the 863 programme and the 973 programme which deal with a lot of different R&D topics in many fields. And through these programmes, automotive R&D is performed. According to our data research, three automotive projects are run under the 863 programme and one under the 973 programme. In parallel, the State Key Laboratories programme is a very powerful network of laboratories, funded by the Ministry of Science and Technology to develop long-term research. Among those laboratories, four have been identified so far as focusing on automotive topics:
Laboratory of Automotive Safety and Energy
State Key Laboratory of Automobile Dynamic Simulation
State Key Laboratory of Environmental Simulation and Pollution Control
State Key Laboratory of Vibration, Shock & Noise

An example has been identified in the Anhui province with the "Vehicle Automatic Transmission Product development and key technology research"

Overall programme initiative name	Programme call name	Programme call description	Funding organisation
National High-Technology R&D Programme	863 programme	National High-tech R&D Programme (863 Programme). This supports pre-commercial high-tech projects, especially in IT and biotechnology. The 863 Programme (so named because it was first outlined in March 1986) seeks to identify high-tech areas.	MOST (Ministry of Science and Technology)
863 programme	Energy-Efficient & New Energy Vehicles Major Project	The “Energy-Efficient & New Energy Vehicles Programme” is part of China’s Medium- and Long-Term Science & Technology Development Plan, and it is seen as China’s response towards Climate Change & Energy Security	MOST
863 programme	Vehicles Development Advanced Technology Programme	The whole aim of this programme is to develop products which shall satisfy the related national regulations by 2010. The products include: passenger cars and heavy duty commercial vehicles; Direct Gasoline Injection Engine and DSG(Direct Shift Gearbox) on Powertrain.	MOST
863 programme	Vehicles Components Machining Automatic Production Line	Based on the national automotive industry requirements, it is focused on the manufacture equipment weak points of engine, transmission, body, etc., grasp the technology of complete automatic production line of the vehicle key parts.	MOST

National Key technologies R&D Programme	Previously called "Gong Guan(Key Problem Attack) Programme", and since 2006 (the 11th. Five years plan), it is called Zhi Cheng (Support) Programme	The Key Technologies R&D Programme is the first national S&T programme in China. It aims to address major S&T issues in national economic construction and social development. Initiated in 1982 and implemented through 5 Five-year plans.	MOST & MOF (Ministry of Finance)
National Basic research Programme	973 Programme	The National Basic Research Programme (also called 973 Programme) is China's on-going national keystone basic research programme, which was approved by the Chinese government in June 1997 and is organized and implemented by the Ministry of Science and Technology	MOST
973 Programme (1 concrete project)	Basic study to the low cost and high density energy storage system for electric vehicle	Electric vehicles (EV) are one pathway for ensuring the energy safety of China, decreasing the consumption of fossil fuel and lowering CO2 emission. Electric vehicles include pure electric vehicles, hybrid vehicles, and fuel-cell electric vehicles (FCEV).	MOST
State Key Laboratories	SKL	The Programme was launched in 1984. Focusing on the S&T reserves for long-term development, it aims at supporting the study and exploration in basic research, applied basic research and high technology through S&T capacity building.	MOST
National New Key Products Programme	New Product Programme	National Key New Products Programme is a government-policy-supported programme put forward by the Ministry of Science and Technology with the purposes of guiding and encouraging enterprises and research institutes to develop new products, accelerate technical	MOST
National S&T Major Project (current name of previous mega projects)	Major Projects	Since 2006, China has fixed 16 Major Technic Projects, including Large Aircrafts, New Generation of Mobile Technology, **High Quality numerical control machining tools**, etc., which shall be broken through in the next coming 15 years.	MOST
"10 cities, 1000 units" energy-saving & new energy vehicles popularization and application project	10 cities x 1000 vehicles	Plans to demonstrate hybrid power vehicles, pure electric vehicles and fuel cell vehicles and infrastructure of energy supply in more than 10 large and medium size cities in	MOST & MOF (Ministry of Finance)

		China each year in the next three years. Each city shall adopt 1000 new energy vehicles.	

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

Due to the lack of details, the partners have found during the project, there is no sufficient information to comment on the efficiency and success rate of the funding process in China.

The flexibility to release new calls in response to changing situations

The new calls releasing condition does not seem to be flexible during the 5 year time frame on the Plan. The programmes are defined and revised if needed during the preparation of the next 5-year plan and the calls are linked to this decision.
Furthermore, most of the programmes in the Chinese RTD structure are long lasting programmes. Either permanently open or lasting for more than 10 years, the programmes are unflexible, for example, one in 973 or 863. At least their direction is set for a long time but as they accept new projects quite often, there is still a flexibility to adjust to new R&D topics.

As the programmes are mainly permanently open, it would be easy for the MoST to implement new projects. But as already mentioned, the main lines are set on a 5-Year basis, leaving new changes to be made when the 5-Year plan is revised.

Transparency & openness

The quest for data in China has not been easy during the project. At the first sight, information seems to be available for programmes and funding but not much is translated in English or simply not available due to website maintenance or missing pages.
Regarding the dissemination activities no results could be found by the partners in an open way. It does not mean they don't exist but either it is not published on Internet or there have not been publications in English.

Foreign collaboration

Some calls seem to be open to foreign organizations. Moreover, some R&D centres for vehicle technology have been settled together with a foreign carmaker. But the programmes seem to be mainly made for Chinese organizations (universities, laboratories, institutes,...) and they clearly have no international focus but a local aim from the directives of the 5-Year Plan.
From the data retrived through the project, the Chinese programmes do not seem to be open to foreign organisations: they are either not declared open or this is not stated in the data sources. This can also be explained by the number of programmes dedicated to national entities such as laboratories, insitutes and universities.

3 Discussion and Conclusion

The analysis of Chinese automotive RTD programmes has been very difficult. EAGAR projects faced the few public information available either not translated in english or simply not disclosed on websites. When identified half of the programmes have been caracterized more than 50% and for all, less than 75% of the details we were looking for could be retrieved. This is the main limitation of EAGAR findings for China.

The desk research as well as the distributed questionnaires also lead to a subjective interpretation of the Chinese R&D policy and R&D programmes where statistical data or specific information are missing. Nevertheless the available information on the considered programmes does allow an analysis of the Chinese policy, identifying trends as well as benchmarking with other economies. The presented information and data just provides a global picture of the R&D policy in China and should be used as this.

Moreover the complex structure of RTD also represented a challenge when trying to sort the mechanisms and rules behind the programmes. In terms of organization it is quite clear that the Ministry of Science and Technology (MOST) is the leader to run the R&D policy in the country. Almost all the calls are run under its direction and funding with the support from the Ministry of Education or the Ministry of Finance in some cases.
The difficulty lays in the structure of the programmes and to identify the projects dealing with automotive R&D topics. These projects are structured into massive state programmes like the 863 programme or the 973 programmes which started prior to 2000 and which mix so many various topics like biotechnology, military applications, healthcare and industrial applications.

However 11 programme calls have been identified. They deal mostly with powertain research and energy storage for future vehicles such as primary batteries and fuel cells but a strong focus has also been identified on methods either for development or for manufacturing.

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5 Annex

Overall programme initiative name	Programme call name	Programme call description	Funding organisation
National High-Technology R&D Programme	863 programme	National High-tech R&D Programme (863 Programme). This supports pre-commercial high-tech projects, especially in IT and biotechnology. The 863 Programme (so named because it was first outlined in March 1986) seeks to identify high-tech areas.	MOST (Ministry of Science and Technology)
863 programme	Energy-Efficient & New Energy Vehicles Major Project	The "Energy-Efficient & New Energy Vehicles Programme" is part of China's Medium- and Long-Term Science & Technology Development Plan, and it is seen as China's response towards Climate Change & Energy Security	MOST
863 programme	Vehicles Development Advanced Technology Programme	The whole aim of this programme is to develop products which shall satisfy the related national regulations by 2010. The products include: passenger cars and heavy duty commercial vehicles; Direct Gasoline Injection Engine and DSG(Direct Shift Gearbox) on Powertrain.	MOST
863 programme	Vehicles Components Machining Automatic Production Line	Based on the national automotive industry requirements, it is focused on the manufacture equipment weak points of engine, transmission, body, etc., grasp the technology of complete automatic production line of the vehicle key parts.	MOST
National Key technologies R&D Programme	Previously called "Gong Guan(Key Problem Attack) Programme", and since 2006 (the 11th. Five years plan), it is called Zhi Cheng (Support) Programme	The Key Technologies R&D Programme is the first national S&T programme in China. It aims to address major S&T issues in national economic construction and social development. Initiated in 1982 and implemented through 5 Five-year plans.	MOST & MOF (Ministry of Finance)
National Basic research Programme	973 Programme	The National Basic Research Programme (also called 973 Programme) is China's ongoing national keystone basic research programme, which was approved by the Chinese government in June 1997 and is organized and implemented by the Ministry of Science and Technology	MOST

973 Programme (1 concrete project)	Basic study to the low cost and high density energy storage system for electric vehicle	Electric vehicles (EV) are one pathway for ensuring the energy safety of China, decreasing the consumption of fossil fuel and lowering CO2 emission. Electric vehicles include pure electric vehicles, hybrid vehicles, and fuel-cell electric vehicles (FCEV).	MOST
State Key Laboratories	SKL	The Programme was launched in 1984. Focusing on the S&T reserves for long-term development, it aims at supporting the study and exploration in basic research, applied basic research and high technology through S&T capacity building.	MOST
National New Key Products Programme	New Product Programme	National Key New Products Programme is a government-policy-supported programme put forward by the Ministry of Science and Technology with the purposes of guiding and encouraging enterprises and research institutes to develop new products, accelerate technical	MOST
National S&T Major Project (current name of previous mega projects)	Major Projects	Since 2006, China has fixed 16 Major Technic Projects, including Large Aircrafts, New Generation of Mobile Technology, **High Quality numerical control machining tools**, etc., which shall be broken through in the next coming 15 years.	MOST
"10 cities, 1000 units" energy-saving & new energy vehicles popularization and application project	10 cities x 1000 vehicles	plans to demonstrate hybrid power vehicles, pure electric vehicles and fuel cell vehicles and infrastructure of energy supply in more than 10 large and medium size cities in China each year in the next three years. Each city shall adopt 1000 new energy vehicles.	MOST & MOF (Ministry of Finance)