

Study on Objectives and Strategies for Energy Conservation and Emission Reduction in Transportation Industry during the 13th Five-Year Plan Period in Beijing

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Abstract

Facing increasing passenger and cargo transport demand and limited resource in the 13th Five-Year period, how to make a breakthrough and substantial progress has become a key issue on planning and the Top-level Design. In this paper we judged and analyzed the current development and potential demand of the energy saving and emission reduction in Beijing traffic industry. Through application of energy and emission prediction model which based on the vehicle activity data, the development goals of “one drop, double control, and triple upgrade” have been put forward. In order to achieve the goal, “5 + 1” development strategies should be implemented, and we also proposed the thinking and recommendations on sustainable development of transportation.

Keywords

Transport Energy Saving and Emission Reduction, 13th Five-Year Plan, Prediction Model, Development Goals and Strategy

1. Foreword

At the end of 2015, Beijing resident population reached 21.705 million and vehicles was totally 5.6 million units [1], mobile development of the megacities, the unbalanced supply and demand structure of urban traffics for population expansion became increasingly prominent and external rigid constraints of energy and environment were becoming more and more urgent.

During the 13th five-year plan period, guided by the five major principles, we'll comprehensively carry forward and implement the five in one layout of socialism undertaking with Chinese characteristics and speed up the development of four transportation sectors while the cleaning energy development strategy, response to climate change and prevention and control of vehicle pollution raise higher requirement on the transportation development. In coming five years, a key period for construction of an international first-class harmonious and livable capital of harmony and comprehensive establishment of a safe, convenient, efficient, green and economic modern comprehensive transportation system, the transformation of transport industry will face double pressures: enhancing quality and efficiency while saving energy and reducing carbon emission. Therefore, how to control the growth of energy consumption and carbon emission gross in transport industry by various means while enhancing service quality will be a serious challenge facing works of transport industry energy conservation and emission reduction.

This paper makes comprehensive analysis on the status and future trend of Beijing's transport energy conservation and emission reduction. Based on the energy consumption and pollution emission estimation model of individual vehicle activity level, the author reasonably estimates the future trend and proposes the objectives of transport energy conservation and emission reduction in Beijing in coming five years; around the objectives, the paper brings out development strategy and raises some reflections and suggestions on the works of transport energy conservation and emission reduction in megacities.

2. Background of Study

2.1. Scope

Currently there are three statistic study measurements for Beijing transportation energy consumption pollutants as shown in **Figure 1**, including transportation, warehousing and postal service, car rental, motor vehicle maintenance and social traffic. Transportation, warehousing and postal service involve aviation transport, railway transport, road transport, pipeline transport, storage and postal service, water transport and handling assistance activities. Transport industry covers the 12 sectors under the transportation commission, including public charge, suburban rail transit, passenger transport, taxi, tourism inter-provincial passenger transport, passenger transport and road freight transport, etc. According to the jurisdiction, the object of this study is mainly the transport industry with social traffics in some parts. By the end of the 13th five-year plan period or 2020, in view of the transport industry energy consumption and pollutant emissions, as well as carbon emissions, with quantitative analysis, the author makes clear objectives and then carries out the study on the development.

2.2. Development Status

2.2.1. Status of Energy Consumption and Emission of Transport Industry

As of the end of 2015, the gross energy consumption of transport industry is 333,

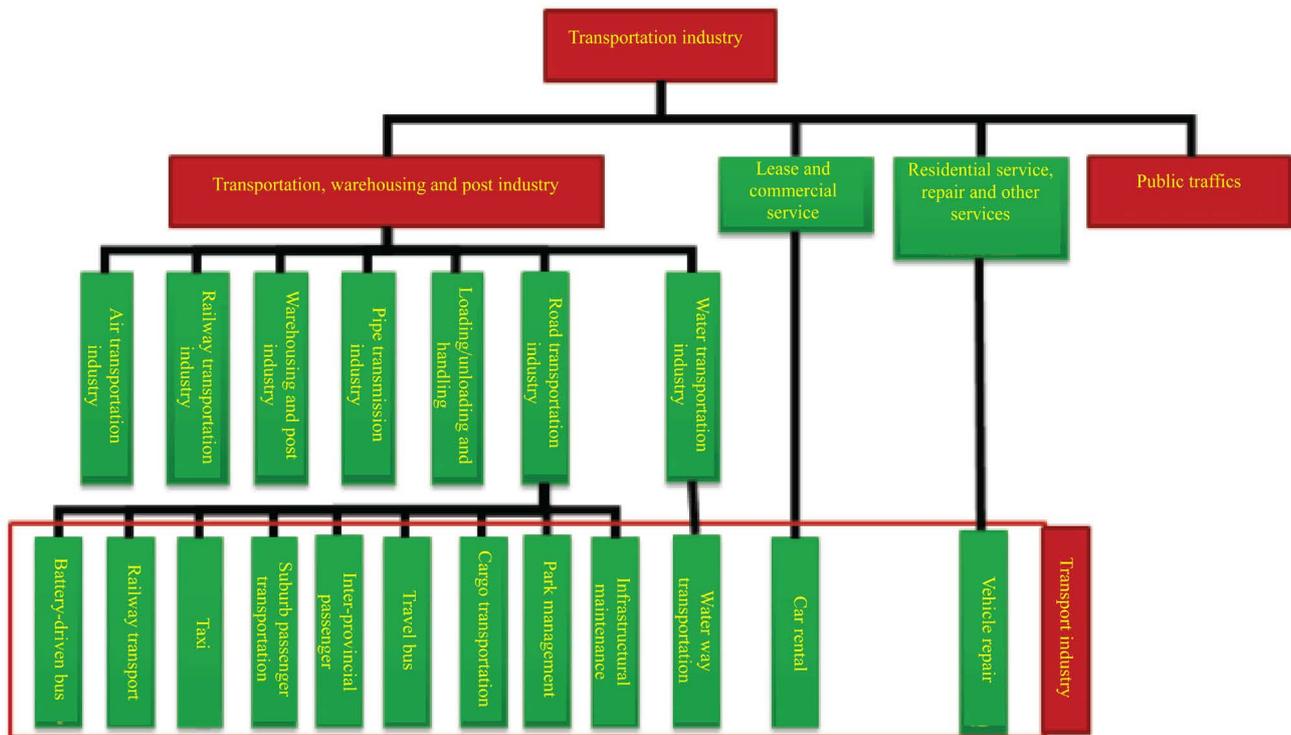


Figure 1. Structure of transport field.

6000 tons of standard coal. During the 12th five-year plan period, the transport industry in the phase of large-scale operation and construction with total energy consumption is 37.05% higher than that in 2010 and the average annual growth rate is 6.49%. In the industry, the freight transportation, the public car, taxi, rail transportation and other sectors are key energy users, respectively accounting for 31.6%, 22.0%, 17.2% and 14.7% of the total. Petrol and diesel are still the main fuels, but as the new expansion of clean energy vehicles and the strong development of rail transportation, the proportion of use of electricity and gas has gradually increased from 17.6% to 13.0% [2].

According to environmental protection authority, the exhaust of vehicles is still a main source of atmospheric pollution. The data of Beijing center for transport industry energy conservation and emission reduction show, in 2014, the main contents of exhaust of vehicles are carbon monoxide and nitrogen oxides, 49.8% and 40.3% respectively. Heavy truck is an important source of PM, NOx and HC in transport industry as one of key areas of pollution emission control in the coming five years. From the gross pollution emissions in transport industry, through various measures, emissions have showed a trend of decline.

2.2.2. Achievements of Works during the 12th Five-Year Plan Period

Compared to industrial construction field with earlier development and increasingly complete system, Beijing municipal transportation’s energy conservation and emission reduction work is still in its infancy. During the 12th five-year plan period by pilot demonstration, we have promoted new energy vehicles and built transportation emissions from energy consumption statistical monitoring sys-

tem and made preliminary exploration to form an urban transport energy conservation and emission reduction development model with Beijing characteristics. We have made following primary achievements:

(1) Green low-carbon travel gets rapid development to promote structured reduction of emissions. During the 12th five-year plan period, by encouraging public to travel with green intensive public transportation, Beijing government has optimized the structure of travel to reduce energy consumption and emissions per capita. The number of users of public transportation and passenger traffic grew from 18.86 million to 20.40 million, total length of rail transit operation increased from 336 km to 554 km, total length of bus lanes increased from 294 km to 741 km, scale of public bike rental reached 50,000 vehicles and proportion of public traffic travel in downtown rose from 39.7% to 50%. The results show that the single travel emissions per capita fell by 28% by the end of the 11th five-year plan period.

(2) Transport energy structure optimization witnesses a breakthrough. At the end of 2015, the ground buses, taxi and other transport industry promoted 22,020 new energy vehicles, the growth rate of 486% in comparison with the figure at the end the 11th five-year plan period. Through new energy car index separate configuration and the non traffic limit policy, the government promoted 13,391 new energy cars among the city's private sector, reduced 340 million litres of gasoline and diesel consumption per year and 1278 tons of pollutants discharge. Industry has eliminated all yellow-labeled cars, and the proportion of vehicles with state IV standard and above standard has been increased from 38% at the end of the 11th five-year plan period to 61% at the end of the 12th five year plan period and the industry's structure of vehicle emissions has been significantly optimized.

(3) Application scale of energy conservation and emission reduction product technology has been gradually expanded. Actively encourage rail transportation, transportation hubs through contract energy management mode, such as application of LED energy-saving lighting, frequency conversion energy-saving equipment like elevators, frequency conversion air conditioning, therefore during the 12th five-year plan period accumulated power saving exceeded 100 million degrees. In the aspects of construction and maintenance of the road, continue to promote energy-saving and environmentally-friendly material to make the proportion of such materials on common roads reached 85% and proportion for old pavement reached 95%. In railway energy recovery, green tires, lightweight car body and other energy saving technical reformation respects, we made breakthroughs.

(4) The infrastructure capacity construction promotes the energy reduction in the transport industry. During the 12th five-year plan period Beijing launched the construction of energy consumption and emission statistics monitoring platform and transportation environment monitoring network, in combination with five-level energy consumption and emissions model system research and development, we have preliminarily implemented refinement analysis and forecast of

industry' energy consumption and emissions. We have compiled and published the five industries' energy conservation standards and effectively link to Beijing municipal bureau of statistics by energy consumption statistical system innovation.

(5) Exploration into transport energy conservation and emission reduction systems and mechanisms get results primarily. Beijing has established Beijing transport industry energy conservation and emission reduction work leading team and the Beijing center for transport industry energy conservation and emission reduction, according to the requirements of atmospheric pollution joint control and prevention in Beijing-Tianjin-Hebei, and the surrounding area, we have established the motor vehicle emission pollution control work coordination mechanism, actively asked the ministry of transport and Beijing for clean air and energy conservation and emission reduction of special policy and funding and support pilot demonstration projects.

(6) Primarily form a social atmosphere for transport energy conservation and emission reduction. We have conducted public organizations to carry out the green travel communication campaigns, using Weibo WeChat and other new media way, we spread the concept of green traffic. For transportation enterprises we held the energy conservation and emission reduction standard stable promotion and technical training to deepen the enterprises work in energy conservation and emission reduction so as to primarily form a transport energy conservation and emission reduction atmosphere in the whole society.

We have made some achievements after past five years, but the depth and breadth of work remains to be promoted, structural reduction potential is yet to be dug out, basic ability remains to be further promoted, public consciousness in energy conservation and emission reduction needs still to be cultivated, and energy conservation and emission reduction management system will help improve adequately.

3. Study on Development Objectives

As to the study on the objective of transport energy conservation and emission reduction by the end of the 13th five-year plan period in Beijing, based on the status and future demand of Beijing in this respect, we should reasonably set development scenario, and use the energy consumption of macro calculation model quantified emissions of science to predict the future energy consumption and pollutant emissions to put forward feasible development goals.

3.1. Scenario Setting

Scenario analysis method gives full consideration to the diversity of the development in the future and takes the collective intention and will of future developing group decision-makers as one of the most important aspects of the scenario analysis [3] [4]. During the process of making the development goals, we adopt the method of scenario analysis and set the scenarios reasonably by the background including the concurrent economic development of Beijing, Tianjin

and Hebei, non-capital functional evacuation and clear urban function orientation.

By the end of the 13th five-year plan period Beijing's resident population is expected to reach 23 million and the city will keep high speed growth in GDP. The active population increase and concurrent economic development of Beijing, Tianjin and Hebei cause demand of inter-city traffic to increase and commuting radius to be extended so as to enhanced the level of pluralism, humanization and refine traffic services. In the transport industry's energy consumption and pollutant forecast scenario, we consider following key factors:

(1) Model structure: energy structure of the vehicles and emission structure, promotion of new energy vehicles, as well as the ascension of petrol and diesel emission standards, promotion of clean and green vehicle structure, will effectively reduce energy consumption and pollutant emissions.

(2) Total car volume in the industry: according to actual operation planning new and expansion the total volume will satisfy the need for growth, it is expected the vehicle scale will be expanded by the end of the 13th five-year plan period.

(3) Energy consumption (emission) strength: Ministry of Industry and Information Industry has released "Standard for the Phase IV of Fuel Consumption by Passenger Vehicles" forecasting that the fuel economics will be improved by over 20% in comparison with 2015. Beijing Environmental Protection Bureau released "Draft for Opinions for "Local Standard for the Phase VI of Fuel Consumption by Vehicles in Beijing" which will be made and released as agreed and implemented since December 1, 2017. The implementation of new emission standards can slash vehicle emissions pollution [5]. In addition, with ecological driving technology promotion, energy consumption and emissions intensity of individual vehicles will decline further.

(4) Mileage: in 2020, with the increase of vehicle volume and transportation efficiency in the industry, it is predicted the average annual mileage will be equal to the figure at the end of the 12th five-year plan period basically.

Outlook of transport industry development in 2020: urban green travel ratio will reach 75%, rail transit operation mileage will reach 900 kilometers or above. The new clean energy bus proportion will be 65% or more; new vehicle rental industry will exclusively use new energy vehicles; in shipping, tourism and other industries, we'll promote new energy vehicles in combination with characteristics of industry. It is expected in 2015 the total vehicle volume in the industry will increase by more than 10% and the total mileage remain unchanged.

3.2. Designs of Modeling

At the city scale, there are three respects influencing transportation energy consumption: urban morphology (features) of land use, traffic system characteristics (traffic network accessibility, convenience and quality of service) and social economic factors (characteristics of personal and family) [6]. To accurately predict the energy consumption and pollutant emission of transport industry by the

end of the 13th five-year plan period, we set up the macro listing model based on bicycle activity level and find the influencing factors of different level are embodied in three important input variables of energy consumption (pollutants) prediction model: fleet structure, range and energy intensity (emission factor); taking microscopic transportation unit as the calculating unit, to achieve the accurate measurement of the total energy consumption, we match energy intensity and driving strength need with attributes of different models as shown in the formula below.

$$T = \sum_i N_i \times (VKT_i \times C_i)$$

T—Gross energy consumption;

N_i—Number of vehicles of different model;

VKT_i—Annual average mileage of *i*th model;

C_i—Fuel consumption per 100 km for *i*th model (pollutant emission factor).

The data of vehicle database came from the database from Beijing Traffics Administration and operative vehicle database of Beijing Transportation Bureau, we make categorization according to the vehicle energy type and vehicle weight. The data such as vehicle fuel consumption structure, activity level and fuel consumption per 100 km have been obtained through the statistics and monitoring and emission factor came from Vehicle Emission Control Center of the Ministry of Environmental Protection which has been improved based on the status of Beijing.

3.3. Objectives

The model prediction shows that during the 13th five-year plan period the total volume of Beijing transport industry energy consumption and carbon emissions will continue to increase, but growth will be under control, and pollutant emissions will make transition from increase to drop. Based on the calculation result and demand the next five years development, we propose a goal “one drop, two

Table 1. Development goals.

	Index	2020	Indicator type
1	Proportion of reduction of pollution emission in transport industry	25%	Restrictive
2	Objective of control of gross energy consumption in transport industry (10,000 tons of standard coal)	420	Restrictive
3	Objective of control of gross greenhouse gas in transport industry (10,000 tons)	1300	Restrictive
4	proportion of new cleaning vehicles in public traffic industry	65%	Anticipative
5	Cycling rate of materials of road pavement	Above 90%	Anticipative
6	Recycling rate of sewage at highway service area	30%	Anticipative
7	Completion rate of government-level monitor and statistics platform for energy conservation and emission reduction	100%	Anticipative
8	Completion rate of energy consumption management and control of key enterprises in transport industry	100%	Anticipative
9	Installation rate of energy consumption measurement instruments on the operative vehicles in transport industry	30%	Anticipative

controls and three enhancements”. One drop: industry pollutant emissions significantly decrease by 25%; two controls: industry energy consumption and greenhouse gas emissions are under effective control; Three enhancements: great enhancements of a new energy use ratio, resource intensive utilization level and energy conservation and emission reduction of fine management level. Among them, total restrictive indicators like pollutant, gross energy consumption and carbon emissions, new energy vehicles scale and recycling rate of sewage at highway service area will be used as reasonable guides to the green development of the industry (Table 1).

4. Study on Development Strategy

To realize the objectives of energy consumption and emission control in Beijing by the end of the 13th five-year plan period, development strategies have been brought out in the respects like transport system, transport tools, infrastructures and relevant management systems, policies and product technologies to guide the conduct of transport energy conservation and emission reduction in Beijing during the 13th five-year plan period.

4.1. Construction of Green Transportation System

The optimization of urban passenger transportation system and enhancement of the level of intensive and transport efficiency are fundamental measures to achieve energy conservation and emission reduction effect.

(1) Enhance the level of public transport services to promote green low-carbon travel.

Continue to promote the construction of urban rail transportation, complete a railway transportation network with clear function levels and reasonable hierarchical structure, dig out potential of existing lines through the energy dissipation equipment modification and the optimization of organization mode and improve railway transportation energy efficiency. Comprehensively optimize and integrate bus lines on the ground, promote construction, optimization and inter-connection of bus-only lanes and build the ground quick bus commuter system. Promote environmental improvement of walking and bicycle traffics, make great to develop the public bicycle and effectively raise the proportion of green travel. By improving the proportion of green low-carbon travel by rail, bus, walking, cycling, etc., reduce energy consumption and emissions intensity.

(2) Optimize freight transportation organization to promote construction of green freight hub stations.

Actively explore into “Internet+” application, optimize the distribution network, encourage university organization patterns like night distribution and joint distribution, improve the level of transportation efficiency and greening. Expand the scale of application of technologies like green tires, research market investment and financing mode suited to the characteristics of the freight industry, further promote application of freight energy conservation and emission reduction technology. Selection conditioned newly established or reconstructed

stations, promote energy-saving building materials, electric handling transmission equipment, energy-efficient low-emission facilities and other equipment, guide the construction of charging devices of new energy vehicles, encourage the construction of yard environment monitoring system and energy management system and carry out pilot green freight yards.

4.2. Use Green Transport Equipments and Tools

Continue to optimize the structure of industry operating vehicles, promote the new energy and clean energy vehicles among ground bus and taxi industry by steps to ensure the proportion of new clean buses will be above 65% during the 13th five-year plan period. Increase the demonstrative application scale of new energy vehicles in rent freight industry. Facilitate the demonstration of new clean travel buses along some commuter lines between the city and key business areas around the city and encourage enterprises to adopt new priority clean energy vehicles. According to local environmental protection standards in Beijing, promote updates in the car industry, promote the use of low -emission vehicles above Beijing VI and higher emission standard, speed up the elimination of high-emission old motor vehicles in transport industry, promote green-oriented emissions structure of operative vehicle fleet. Cooperate with planning, and development and reform and other relevant authorities in making gas and power charging facilities planning and build functional bus special gas charging network relying on the bus terminal. Perfect social public charging facilities and provide priority for electric taxi in charging service. Actively explore into diversified gas and power charging infrastructure and service patterns.

4.3. Green Transportation Infrastructure

In the process of traffic infrastructure construction, from the early -stage the planning and design, to the construction and maintenance, we should fully integrate the concept of ecological and environmental protection and advocate ecological transportation infrastructure construction. in the planning and design stage, according to the regional ecological carrying capacity, we should reasonably optimize scale and layout of transportation infrastructure network and avoid “forbidden areas”; In the construction phase, we should promote the application of energy conservation and emission reduction technologies like mixing asphalt under a certain temperature, asphalt cold regeneration, boost the applications of snowmelt asphalt pavement, such as low noise pavement and other functional road technology. We should implement energy conservation and environmental protection at expressway service areas and promote the applications of photovoltaic power generation, LED lighting, energy-saving power supply, sewage disposal and recycle and some other energy conservation and emission reduction technologies. In maintenance phase: we should reasonably design transportation infrastructure maintenance cycle, choose curing technology ecological and environmental friendly. We should eliminate maintenance devices with high energy consumption and high emission and encourage post-assessment on the

ecological environment impact of the transportation infrastructures. For transport infrastructure which cannot meet the latest environmental protection requirements because of the early construction idea and technical reasons, we should implement special ecological restoration projects.

4.4. Boost Applications of Green Transportation Technologies

Further release potential of traffic field's emission reduction and promote energy conservation and emission reduction with science and technology. At the same time continue to strengthen construction of fundamental ability of statistical monitoring system, measuring system and energy consumption and emission model and other energy conservation and emission reduction.

(1) Further promote technologies and products in energy conservation and emission reduction

Rail transport: carry out energy-saving reconstruction of lighting system transformation and ventilation and air conditioning system, dig out the energy saving, explore into the application of brake absorption technology and select and integrate various energy conservation and emission reduction technologies like environmental quality monitor, energy management system and train renewable energy recycling to form green demonstration points. In the respect of exhaust treatment: promote applications of industry transportation vehicle exhaust treatment, particle trap, fuel additives, etc and strengthen the effective application of efficient emission—reducing devices. Ecological driving: study the driving behavior modification techniques and effect evaluation methods, conduct ecological auxiliary driving system research and development, and select enterprises to carry out the demonstration. In the green maintenance aspects: establish and perfect the green automobile industry management system, promote green motor repair technology and form sets of process specifications with less maintenance waste and harmful emissions and high resource utilization.

(2) Keep enhancing construction of infrastructural capacity

Complete the construction of transport energy conservation and emission reduction statistical monitoring system, build Beijing's transportation energy conservation and emission reduction statistics and monitoring platform (phase II), promote the construction of the energy management platform at enterprise level, achieve interconnection between business platform with government, establish a statistical monitoring system covering energy consumption, fuel and emissions, carbon emissions and other indicators, radiating the Beijing-Tianjin-Hebei area. Push for transport industry measurement standardization, promote advance installation of vehicle-mounted measuring instruments, gradually realize complete coverage of industry vehicle monitoring measurement and make key breakthrough in new energy vehicle and facility efficiency testing. Gradually improve Beijing's transportation environment monitor network system, enlarge the coverage of online monitoring, strengthening the construction of transport energy conservation and emission reduction laboratory and improve the capacity of traffic environment monitoring. Carry out technology research and development

and the system construction of 4-level traffic comprehensive energy consumption and emission model, and make breakthrough in the traffic pollution control integration, the contribution rate of the motor vehicle exhaust pollutant, real-time dynamic energy consumption and emission evaluation on urban road network traffics and traffic pollution index.

4.5. Cultivation of Consciousness of Green Behavior

Traffics relate to the daily life of people's livelihood, so the active participation of the whole society is required to promote energy conservation and emission reduction. During the 13th five-year plan period we should give full play to the potential of society and the public and form a harmonious atmosphere of the whole society in participating in and common governance.

On the one hand, we should increase social consciousness propaganda of green low-carbon transportation, at the same time, facing vehicle drivers in the city, we should carry out the ecological driving training and promotion and popularize ecological driving concept and technology. In addition, we should strengthen the enterprise's main body responsibility consciousness, through policy promotion, corporate training and other forms, promote enterprises to carry out the energy conservation and emission reduction technology innovation, research and development and application, encourage enterprises to independently develop construction of energy management system, and configuration and other measuring instruments, and actively participate in carbon trading, energy audit and cleaner production audit work. At the same time, we should strengthen the cooperation and communication with the international-related organizations and give full play to the advantages of technical resources and international channels. Eventually we'll make the whole society working together to promote an environment and atmosphere of energy conservation and emission reduction.

4.6. Green Transportation Management System

During the 13th five-year plan period, Beijing's transport energy conservation and emission reduction work will enter into the phase of construction of integrated management system and improve comprehensive management ability to work through perfecting the policy system, innovation of systems and mechanisms.

We should strengthen source management of energy conservation and emission reduction, implement the demand management policy of integration of pollution control and jamming prevention, adhere to the total amount of passenger vehicles under control within 6.3 million by 2020 and increase the proportion of new energy car index. We should make integrated use of economic levers and necessary administrative means, effectively reduce the intensity of motor vehicle use, guide outgoing transit heavy diesel trucks and other vehicles to bypass the city roads and reduce emission from transit vehicles.

We should perfect the energy conservation and emission reduction policy

system, implement application of green freight policy to push for application of energy saving technology, transport efficiency optimization and enhancement of energy conservation and emission reduction management ability, study and establish the green tourism coach enterprise development evaluation index system and incentive policies, establish, improve and implement vehicle inspection and maintenance (I/M) system and standard system and improve the ability of vehicle exhaust control. We should research on monitoring and evaluation policy in operating period as to traffic projects.

We should complete the relevant standard for reduction of energy conservation and emission, push for the measurement data collection, measuring device test and other respects of operative vehicles as well as prepare and release of industrial and local standards in the respects of energy-using equipment, facilities, transportation enterprise management, energy efficiency and carbon emissions and construction traffic infrastructure and speed up the revision of standards.

We should explore into innovation of green traffic mechanism and system, study the construction of energy conservation and emission reduction legal system and find ways to achieve goals by legislation. We should further make clear boundary and assessment indicator system of traffic energy consumption, fuel, pollution emissions and carbon emissions and implement target decomposition and appraisal system for transport energy conservation and emission reduction.

5. Reflections

5.1. Transportation Energy Consumption, Pollution and Carbon Emissions Are Closely Related to Each Other and Need to Be Governed as a Whole

Energy conservation and emission reduction work in traffic field involves three areas: energy (fuel), pollutants, carbon emissions and three has close correlation with others, but there are certain effect exclusivity and conflicts of interest under different policy orientations. At the same time traffic moving source and energy consumption and emission show regional transmission characteristics. Based on overall consideration of interests of all parties, we need to build up a regional coordinating mechanism among authorities like environmental protection, development and reform and traffics, as well as different provinces and cities and fully consider the relation among energy, pollutant and carbon emission when making relevant policies and measures for energy conservation and carbon emission reduction and air quality improvement.

5.2. Structural Optimization Is an Important Approach of Megacities to Break the Bottleneck for Development towards Green Traffics

As a megacity with population of more than twenty million, restricted by factors such as land, resources and environment, Beijing must give full play to the important role of public transportation, increase attraction by improving public transportation service level, facilitate the implementation of demand management

policy, effectively reduce the intensity of use of the cars and make travel structure optimized. At the same time, combining with the supply side structure adjustment strategy, we should promote new energy vehicles, improve emissions standards, make green low-carbon development of vehicle structure and launch new policies to encourage the applications of new clean energy vehicles in private sector. Structural adjustment of traffics and transportation is the basis for governance of pollution and traffic in a megacity.

5.3. Consolidate Infrastructural Capability to Promote Reduction by Inherent Capacity and Obtain the Actual Effect

Currently the data base of traffic emission energy consumption is relatively weak and the issues like different diameters and unclear base still exist. All of collection of data of mobile source emissions, analysis and forecasting for decision making and massive multi-source heterogeneous data mining analysis need to be solved through construction and perfection of infrastructural capacity.

We need to build a perfect traffic energy consumption and emission statistical monitoring system to master the real level of emissions of mobile source and fixed sources, construct traffic environment monitoring network and control quality conditions surrounding traffic facilities and further explore the effect between traffic and air pollution and influence on human health while using the multi-level comprehensive model to effectively integrate mass multi-source data, strengthening mining, analysis and application, paying attention to effect assessment and quantification of all kinds of energy conservation and emission reduction measures, and supervise and enforce enterprises with high energy saving and high pollution strictly based on objective data. We should reduce the ambiguity of decision-making and promote actual effect from “reduction by inherent capacity”

6. Conclusion

In the background of constructing an international first-class harmonious and livable capital in Beijing during the 13th five-year plan period, a higher view of strategy is necessary to see the conduct of transport energy conservation and emission reduction. All of the pattern selection, strategic policy and goal setting of urban traffic development around need corresponding adjustment around this direction. Energy environment as an external rigid constraint will stimulate the endogenous power for development of transport industry and green environmental protection will lead the transformation and upgrading of Beijing's transport industry in coming five years.

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