REPAP 2020

Renewable Energy Policy Action Paving the Way towards 2020

Portuguese Roadmap of Renewable Energy

Enforcement of RES Directive 2009/28/CE

- Executive Summary -

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Executive Summary

This document was developed by APREN in the scope of the European Project REPAP 2020 – Renewable Energy Policy Action Paving the way towards 2020. This project has the objective to help the drafting process of the National Renewable Energy Action Plans (NREAP) that each Member State must present to the Commission by June 2010, according to what is defined in the Directive 2009/28/CE (RES Directive). This Directive sets the national target for all Member States, of the share of energy from renewable sources in gross final consumption of energy in 2020, which is 31% for Portugal, as well as a common 10 % target for energy from renewable sources in transport.

In terms of reference situation, the total final energy consumption in Portugal has increased 66% between 1990 and 2008, from 10915 kton to 17508 ktoe. From 2004 on, the consumption has stagnated, and even decreased in 2007. During the last decade the biggest increase was felt on the electricity sector (118%), followed by the transport sector (91%) and finally the energy consumption for Heating and Cooling (H&C) (30%). The energy consumption for transportation has gotten closer to energy consumption for H&C, and in 2008 both values were almost the same.

Regarding the contribution of RES in the final energy consumption, it is the electricity sector that has shown both the biggest increase and the highest quota of RES. While the electricity production from fossil fuels has been around 30 TWh, compensating the hydro production, the electricity from RES has almost doubled in the last ten years. The biggest incentive for this growth was the establishment of feed-in-tariffs (FiT) starting as from 1999. The Program "Renováveis na Hora" has boosted the decentralized production of renewable electricity through microgeneration, even though it needs a revision which is now in place.

In 2009 the quota of electricity from RES was 40,7% (value corrected according to the average hydro production). This fact makes the 45% target of electricity from RES in 2010 set by the Government in 2007 more realistic to be attained. However this quota can only be reached if 2010 keeps the tendency of a rainy year and if total energy consumption keeps slowing down.

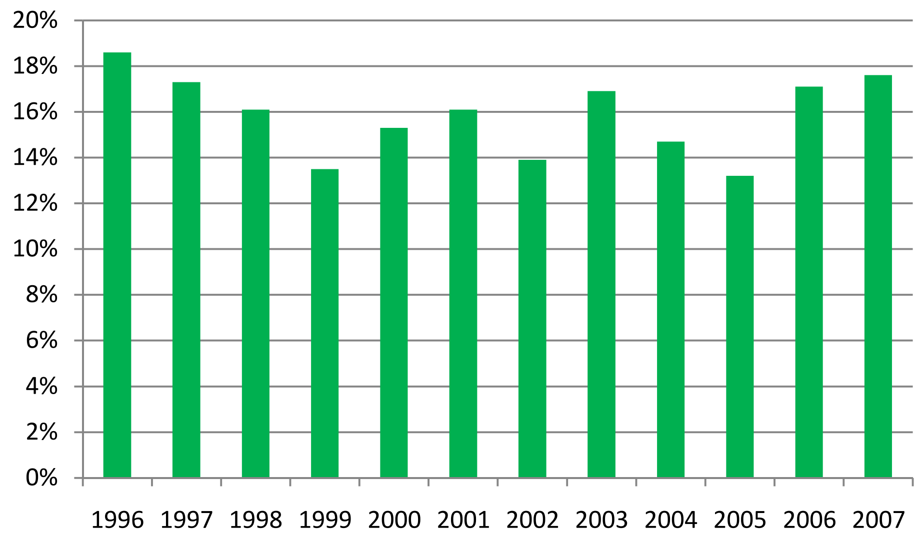
The gross final consumption of RES for H&C has been practically constant until 2008. The share of renewable energy for H&C in 2008 was 26%. Solar thermal energy has experienced a large increase in the last years, mainly in 2009, thanks to the Government's Solar Thermal Measure and to the recent building legislation. Nowadays there are more than 600 000 m^2 of solar thermal panels installed, 250 000 of them in 2009.

The use of biomass for H&C purposes has only been registered for the industrial and domestic sectors. Besides the fact that biomass consumption for H&C has a bigger share in the domestic sector, the biomass consumption in this sector has decreased 10% between 1990 and 2008, while biomass consumption for the industrial sector has increased 30% during the same period. It is important to mention that most of the biomass consumption for H&C in the industry sector is from Combined Heat and Power (CHP) power plants (91% in 2007). Biomass consumption for H&C has some specific incentives for SME's and incentives associated with microgeneration, but nothing meaningful.

In the transport sector, RES consumption is still not significant. A target of 5,75% for biofuels used in road transportation by 2010 was set. However the former Government has increased this goal to 10%. Considering the low penetration of biofuels on road transportation in 2008 (1,91%) a mandatory incorporation of 6% of biodiesel (in volume) in 2009 and 10% in 2010 was decreed. These obligations will allow for a shift in the situation in 2009 and 2010, but a penetration of biofuels higher than 5,5% is being limited by the European Standard EN 590.

According to Eurostat, the share of renewables in gross inland energy consumption in Portugal between 1996 and 2007 has reached a maximum of 18,6% in 1996 and a minimum of 13,2% in 2005. The Directive states that for the base year of 2005, the Portuguese share of energy from renewable sources in gross final consumption is 20,5%. The difference of these values can be partially explained by different methodologies used, but nevertheless there is a strong possibility that the real value is lower than the 20,5% set in the Directive. This fact means that Portugal faces an even more ambitious target because it starts from a lower level.

Graphic 1 – Share of renewables in gross inland energy consumption in Portugal (1996-2007). Source: Eurostat.

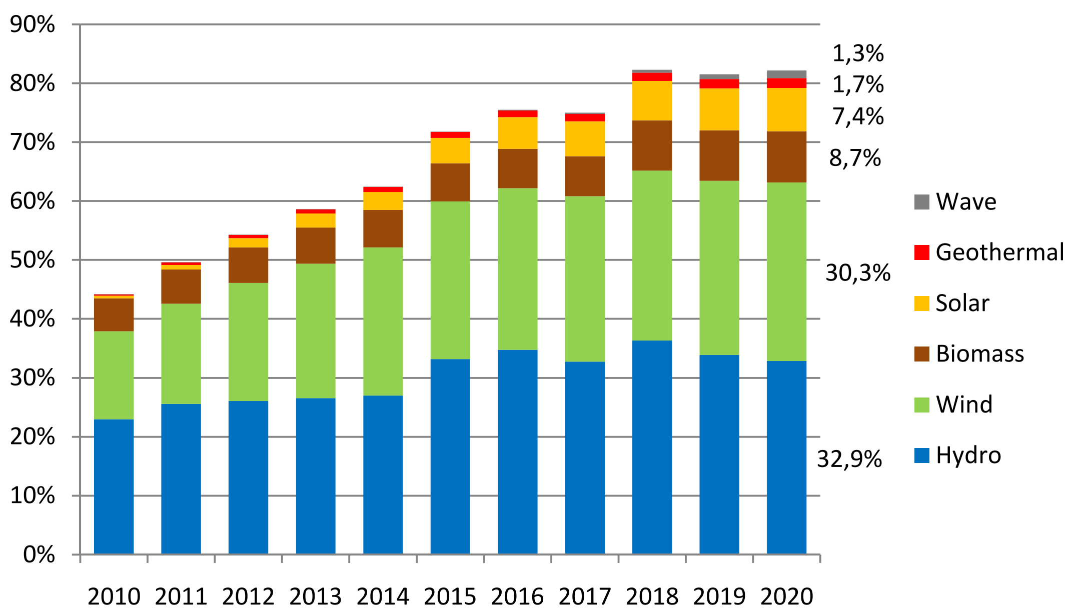


The forecast presented in this document shows a softening of the consumption growth in all sectors. However it is important to underline that, even considering the energy efficiency measures predicted in the National Energy Efficiency Action Plan (PNAEE), there is still an increase in the consumption between 2010 and 2020. Therefore there is a need for a much stronger investment on energy efficiency to fulfill with the target of 1% energy savings per year until 2016 as established by the Directive 2006/32/CE. In the same way the Government commitment of decreasing 3% of the consumption in 2012 and 10% in 2010 will hardly be achieved.

The expected evolution of RES consumption in the electricity sector will lead to a predicted share of 82% of renewable electricity in 2020; 33% from hydro and 30% from wind. In 2020, the electricity from thermal power plants will only account for 13% of the total consumption, a little bit more than 6 TWh. This means that, if all the natural gas combined cycle power plants predicted start operating, the total installed capacity of thermal power plants will exceed the predicted demand, even taking in consideration the extra capacity needed of this type of power generation for grid management. This outcome means that there is a need to clarify the national energy strategy for the electricity sector, since the investments and targets actually in place seem to be contradictory.

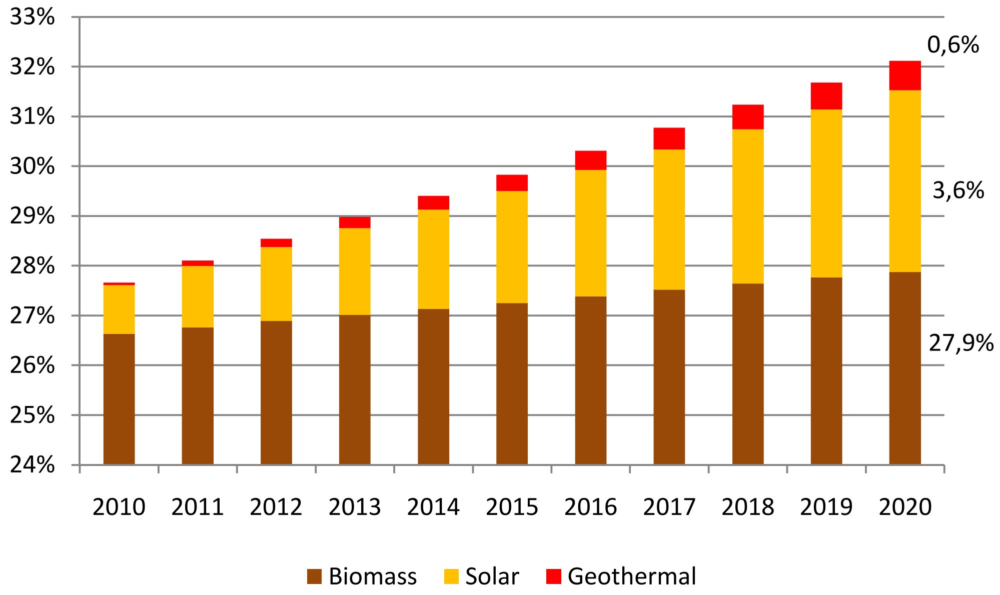
The high penetration of RES in electricity consumption opens the discussion to other issues, namely to understand how the transition of wind power from FiT to market conditions will take place, and what are the impacts of the 82% share in the electricity trade. The cost at which the electricity transactions are going to take place is also essential to evaluate the best way to manage the overproduction that is expected to happen in 2020 in the off-peak hours, as well as the financial sustainability of the Portuguese Energetic System. Therefore a strategic planning of the electricity sector it fundamental for the next decade, that will result in a clear policy that should forecast how to manage the consequences of the capacity surplus expected for 2020.

Graphic 2 – Share of RES in electricity consumption per technology in Portugal (2010-2020).



The penetration of RES in energy consumption for H&C will allow Portugal to evolve from a quota of 28% in 2010 to 31,5% in 2020. The biggest contribution is expected to come from biomass resources, for which a specific share for pellets consumption was considered in the scenario. However, the biggest growth will come from solar thermal due to the generalized installation of solar panels for solar hot water and steam production in industry considered in the scenario.

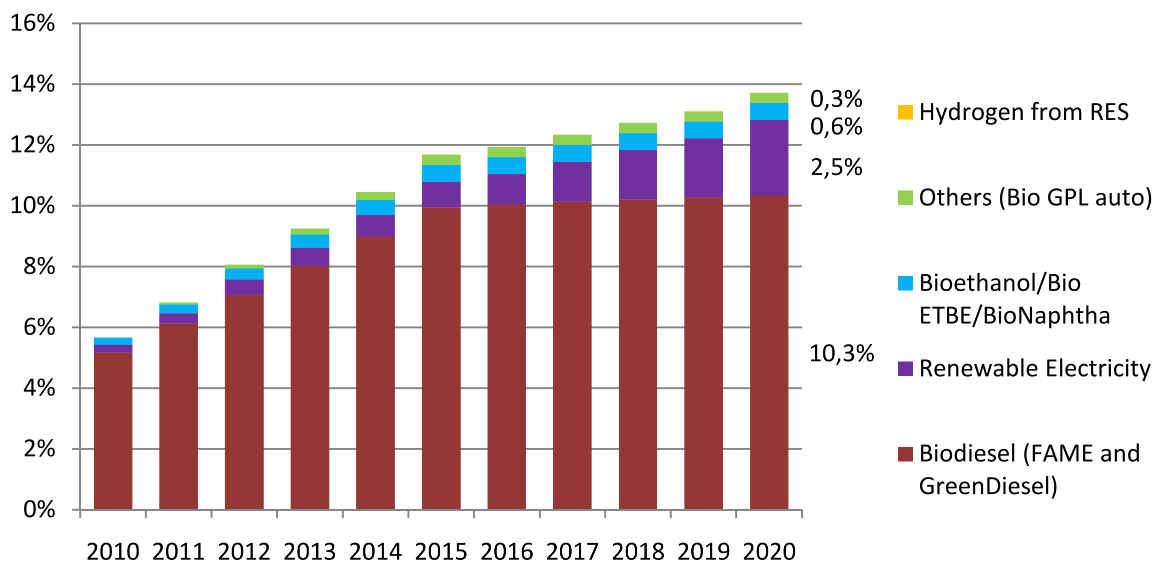
Graphic 3 – Share of RES in final energy consumption for H&C in Portugal (2010-2020).



The scenario presented in the document indicates that it will be possible to overcame the 10% target for RES share in the transport sector in 2020, reaching 13,7%. However it will not be possible to achieve the target of 10% incorporation of biofuels in 2010, which is an objective stated previously by the Portuguese Government. The impact of electric mobility will be small on the short/medium term, demanding at the beginning an effort in the introduction of biofuels, especially second generation biofuels.

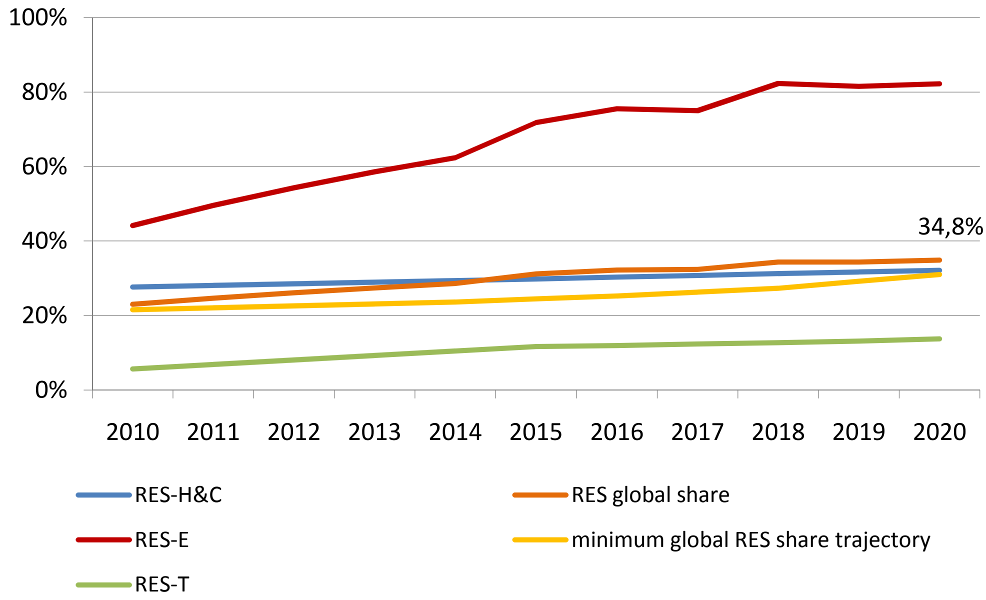
It is important to underline that the concretization of this scenario implies several changes in the sector legislation, as well as in the control mechanisms of introduction of biofuels in the market and the incentive schemes to biofuels production.

Graphic 4 – Share of RES in final energy consumption for transportationin Portugal (2010-2020).



In global terms the conclusion is that the Portuguese target of 31% can be overcome, reaching a share of RES in total final energy consumption of 34,8% in 2020. The RES-E share will be the highest; 82,2%, compensating the lower share of RES-T of 13,7% and finally the RES-H&C share increases almost in a linear way with values within the range of the global share.

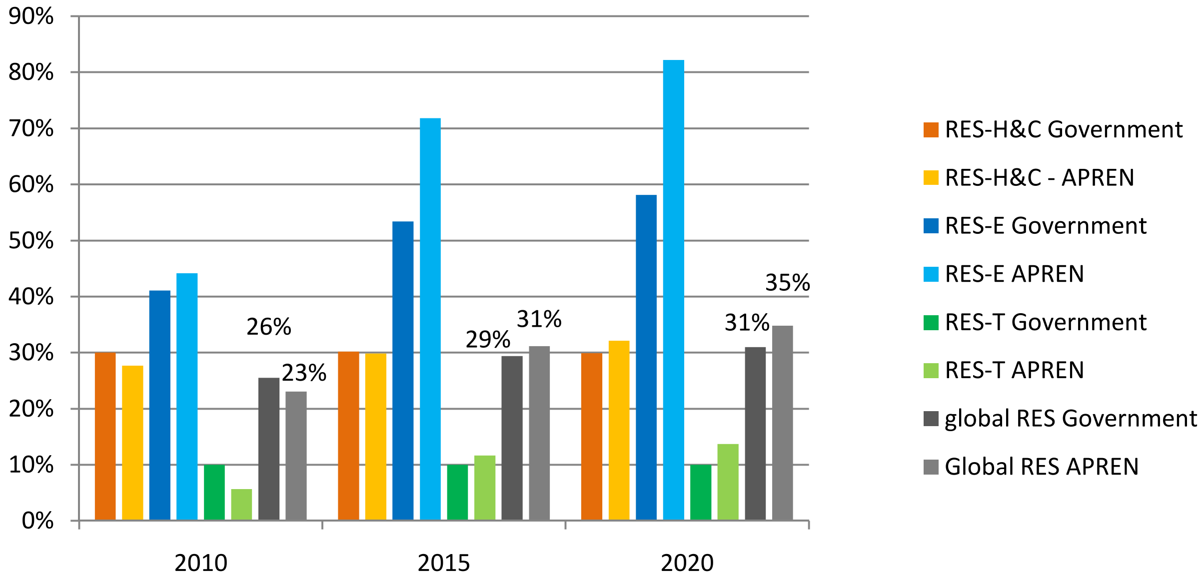
Graphic 5 – Trajectory of the sectorial and global shares of RES for Portugal (2010-2020)



The fact that Portugal will be able to surpass its target by 3,8% indicates that the Portuguese Government should start negotiations with other Member-States to take the most advantage of the flexibility mechanisms allowed by the Directive, with the economical benefit for the country that such an arrangement would bring.

As a curiosity, the more optimistic scenario considered by APREN of which the calculations are presented in the Appendixes, leads to a global RES share of 39,3%, with the same 82% RES-E share, but reaching 42% share of RES-H&C and 18% share in RES-T.

In comparison to the forecast document delivered to the Commission in December, the main difference is in the RES-E share. Considering that the APREN and the Portuguese Government forecasts for electricity consumption from RES in 2020 are similar, the discrepancy is due to the much higher forecast of total electricity consumption made by the Government (73.944 GWh) compared to that of APREN (56.450 GWh). This might be an alert that probably the energy efficiency official program is not being taken in consideration. There is also a small difference in the RES-T and RES-H&C share, more optimistic in the APREN scenario.



Assuming that the Portuguese Government will continue investing in RES, it is important to consider that the objectives are ambitious and that, if the proposed support measures in all sectors are not implemented, good political will is not enough and Portugal might not fulfill with its targets. This is why, as important as defining targets, it is also fundamental to identify and implement the necessary policy which will give the industry, investors, promoters and consumers the confidence and the benefits that justify an investment in RES, which in turn will make the objectives possible.

The main support measures proposed for RES-E concern overcoming the barriers in the licensing process. These include speed up the mechanisms to comply with spatial plans, the implementation of a *one-stop-shop*, an alteration to the composition and operation of the Environmental Evaluation Committee and finally change the rules for granting power connections. It is also very important to update the value of substitution energy used to calculate the FiT as foreseen in the law, as well as restore the update of the tariff with inflation.

Regarding specific measures for each RES-E technology, in terms of wind power, it is necessary to prepare a scheme to phase out FiT and introduce a market price plus an environmental premium in substitution, and readjust the tariff for over equipped wind farms and for the installation of communication equipment for grid management.

For offshore technologies it is fundamental to perform a characterization campaign of the existing wave and wind resources, open a funding scheme for these less mature technologies and, very important to wave power, is to catalyze the current stand-by situation of the pilot zone.

Solar power development in Portugal lacks a better use of the solar resource which should be improved through an investment in PV and thermal power plants and in the minigeneration regime, i.e., decentralized installations connected to consumption, as well as the development of faster and independent licensing procedures. It would be also interesting to associate measures of energy efficiency to the FiT paid to the producers-consumers.

The biomass sector has been having a gradual growth, and it is expected to explode in the coming years, not only due to the dedicated forestry biomass power plants, but also thanks to smaller sources like waste derived fuel, biogas and sludge from wastewater treatment plants. The forestry biomass needs special attention due to the lack of resource, whose consequences are already being felt and which will only worsen in the future in case the measures to increase the availability of the resource are not urgently taken.

The measures to increase forestry biomass availability are proposed in this document and include the implementation of forestry cleaning programs, energy crops and technologies of forestry management. It is also clearly stated that any projects for co-burning of biomass in coal power plants should be rejected, based in the lack of resource, the need to study the technical feasibility of the solution and the fact that electricity production in coal power plants is expected to decrease dramatically in the next decade. A cost-benefit reevaluation of the better use for biomass should be performed. Finally, the sector could also benefit from a discussion at the European level of the tariff differences amongst Member States, to eliminate artificial market distortions that are now acting in the market, resulting in mass exports of biomass out of Portugal.

The development of geothermal power is dependent on the promotion of a campaign to determine the underground geothermal gradient in the Portuguese mainland, the definition of a regulatory framework in terms of FiT and power granting schemes, and the creation of a specific insurance for geothermal risk sharing.

In terms of the current FiTs, APREN proposes the following changes: publication of a specific tariff for wind offshore and geothermal power for Enhanced Geothermal Systems technology; increase the guaranteed period of the tariff for solar technologies with the respective decrease of the tariff value and a revision of the wave power tariff.

For the H&C sector, measures concerning information and training are particularly special. Other measures include the requirement for all new urbanization, to conduct a mandatory viability study for a global H&C solution which will maximize the use of RES.

The Solar Thermal Measure promoted by the Government and responsible for the actual boost in the installation of solar thermal panels needs to evolve. This Program should start to distinguish the quality of the equipments, indexing the subsidies to the energy produced, instead of subsidizing the number of installed square meters. It is also important to consider the combined use of other RES as well as include specific incentives for the hotel industry and the heavy industry with heat demands.

Reducing the VAT of biomass products to 5% is the most important measure of this sector for H&C purposes. Besides that the sector also needs the promotion of a pellets' burners' national industry and better incentives for combined heat and power generation from RES, namely increasing the electricity FiT and introducing a FiT for the heat production as well.

The use of geothermal resources for H&C lacks policies and measures in terms of awareness raising campaigns, a resource characterization study and putting available specific incentives for this technology.

RES-T sector is in need of measures regarding the sustainability certification of biofuels and the inspection and certification of the amount of biofuels introduced in the market. This could be achieved with the creation of a National Certification Authority which would have as associates the sector stakeholders, such as biofuels producers and distributors.

It is crucial to legislate a mandatory quota for the incorporation of biofuels for road transportation for the medium long run, including failure penalties and an effective inspection system.

Another proposal for the transport sector is to restructure the tax on oil products, which would be the sum of an Energy tax related to the energy needs and a Carbon Tax related to the Green House Gas (GHG) emissions of the fuel. This tax would differentiate and promote biofuels according to their impact on the environment, resulting in a corresponding reduction of the country GHG emissions.

The use of more advanced second generation biofuels should also be supported by means of funds for R&D and a bonus for introducing these products in the market.

To conclude, one cannot forget measures to promote changes in the behavior of car drivers. Concepts like car pooling, car sharing, demand responsive transporte, park&ride, parking planning should be more and more in place, along with the promotion of intelligent transport systems and the use of information and communication technologies to increase energy efficiency in road transportation. Measures to increase the utilization of public transportation must also be considered.