

Electric Mobility gets up to speed

2011-2015 Action Plan

3 October 2011

1. A new phase for electric mobility

1.1 Why do we need to cultivate electric mobility?

There are a number of reasons why the Netherlands should continue to stimulate the electrification of transport:

To reinforce the economic position of the Netherlands

- Scaling up electric transport offers the Netherlands the unique opportunity to obtain a competitive edge, as it is a very suitable test bed for this concept due to the short distances, the flat terrain and the densely populated area of the Randstad.
- Electric mobility could boost both the economy and employment considerably, specifically for the suppliers in the sector in question and the development of batteries, services, ICT and related knowledge institutes in the Netherlands. As the surrounding countries are also working on large-scale innovations in this field, rapid and decisive action is required from the government and the business sector.

To help conserve the Netherlands' power reserves

- Electric cars stimulate the transition from fossil fuels to (sustainable) electricity. Currently, road transport in the Netherlands is using up 32 per cent of the nation's oil needs and switching to electric mobility would sever its dependence on specific petroleum-based energy sources such as petrol and diesel, ultimately altering the energy requirements in the automotive sector.
- An electric engine is considerably more efficient than a combustion engine.
- In the long term, the power companies will be able to use their energy more efficiently, as the peak times shift to nights due to the growing demand for electricity to recharge car batteries.
- In the long term, the batteries in all those cars could be used as a storage system for power companies; wind energy, in particular, is subject to peaks and drops in production, due to changing winds and the batteries could serve as buffers in which electricity from sustainable sources could be temporarily stored.

To contribute to the climate change goals by reducing CO₂ and to improving the quality of life in towns and cities by reducing air pollution (NO_x and fine dust)

- From start to finish - from manufacture to use -, electric cars have noticeably lower CO₂ emissions than that of other cars, although much depends on the car's technology (hybrid or all-electric) and the composition of the electricity production.
- Electricity production is governed by the European CO₂ trade system ETS, and guarantees that the total of CO₂ emissions from power companies (and heavy industry) will not increase, even if more power is supplied for electric cars.
- Electric vehicles have few or no tail pipe emissions and consequently contribute to better air quality. Accordingly, introducing electric vehicles to specific areas will help solve the problem of hotspots in the short term, while the Dutch economy will benefit considerably from the implementation of measures, such as the use of electric vehicles, that can tackle the sources of the issue, i.e. the reasons why air quality standards are exceeded.

The Action Plan dovetails with prevailing coalition agreement, as it is instrumental in reinforcing the economic position and in improving the conservation of the power reserves.

Large-scale implementation is necessary if electric transport is ever to become a significant factor in society. Promoting electric mobility could lead to approximately 200,000 electric cars on the road by

2020, and a mature market of around 1 million cars by 2025. This may be a distant figure, but one to which we shall adhere in this Action Plan, which draws on the Electric Vehicles Action Plan submitted earlier to the Lower House (Parliamentary Documents, 2008-2009, 31305, no. 145), by which we mean we shall adhere to its intentions and scenarios until the year 2020 and use it as a referential framework.

This Action Plan will not be limited to discussing electric *passenger* cars; we shall also focus on electric rubbish trucks, buses, scooters and if possible, leisure boats, to boost the electrification of all means of transport in the best possible way. We need to stimulate the use of electric scooters, for instance, to improve the quality of air and the quality of life in towns and cities. In addition, electric scooters and the electric (push) bikes are practical means for acquainting the public with electric mobility.

1.2 In retrospect

In recent years, the national government has made great efforts to stimulate electric transportation, concentrating on two main themes: firstly, by setting up the Formula E-team. The stakeholders, under the direction of H.R.H. Prince Maurits of Orange, act as driving forces and have eliminated some major obstacles. Secondly, the government implemented certain measures to bring about the following factors: field trials and demonstration projects; the stimulation of charging and power infrastructure systems; the development and manufacture of electric vehicles and/or parts; the creation of consortiums and coalitions, and a policy to support the implementation of these measures.

At present, there are more than 700 electric cars in the Netherlands and a comparable number of public and private charging points. The expectations are that another 1,000 public charging points will be installed before the end of 2011, and that about 3,000 electric cars will be supplied to the Netherlands. Between eight and twelve new models will be launched; all the major car brands are currently working on electric cars.

The Formule E- team's activities and the government's measures have led to:

- A successful tender for the test bed for hybrid and electric mobility (9 projects);
- Successful impetus for research and design by High Tech Automotive Systems (HTAS) tender, 15 projects;
- The establishment of a NEN standards committee for electric transport (a Dutch agreement on technical aspects: a standardised plug);
- Universal access to charging facilities in the implementation phase;
- A government vision and roadmap for development of a market model for charging services;
- A finished exploratory inquiry into safety aspects by the Dutch Road Transport Directorate (RDW), the Netherlands Organisation for Applied Scientific Research (TNO) and Testing, Research and Engineering Consultants to the Electric Power Industry (KEMA);
- Amendments to the Vehicles Regulations so that vehicles submitted to the RDW for a national single or small series approval (including any modifications made to the construction after the vehicle's registration) must meet more stringent requirements;
- Extension of the Environmental Investment Deduction/Random Depreciation Environmental Investments (MIA-VAMIL) regulations to include electric (passenger) cars with CO₂ emissions lower than 50 grams per kilometre;
- The joint launch of a battery-testing centre in Helmond with international partners;
- A knowledge and innovation agenda for the Netherlands drawn up by D-Incert.;
- Exemption from private motor vehicle and motor cycle tax (BPM) and motor vehicle tax (MRB). Addition for tax purposes for zero-emission cars to be lowered to 0%, effective to the end of 2014;

- Intensified international collaboration in research and development of European policy; a transnational test bed in conjunction with Nordrhein-Westfalen.

Although much progress has been made in introducing electric transport, we are not there yet, as we still face obstacles related to such matters as:

- a. The development of the charging infrastructure, the lack of a market model and a business case for public charging points and innovative charging methods;
- b. The availability of vehicles, particularly for specific focus groups;
- c. The range of electric vehicles is still limited;
- d. The prices of electric vehicles are still too high¹.

The market for electric transport is fragile and vulnerable, and will remain so until at least 2015. Electric transport might acquire a more solid market position if the market players, the knowledge institutes and the government can collaborate efficiently. From 2015 onwards, reviews of the large-scale commercial use of electric mobility “in the market” will determine if and when government intervention can be gradually scaled down.

1.3 The position of the Netherlands in comparison to other countries

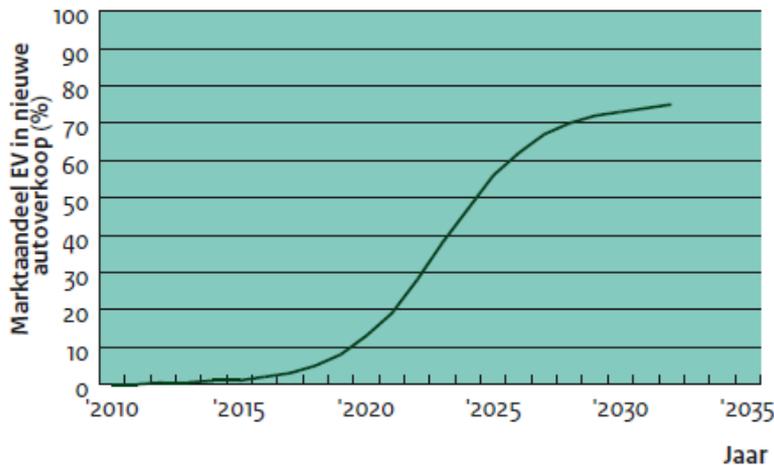
In recent years, international competitive governance has evolved. A study,² published in April 2010 ascertained the position of the Netherlands regarding electric mobility in comparison to 17 other countries. In this benchmark study, the Netherlands emerges as an attractive test bed for electric mobility, as there is a relatively large amount of government involvement, a relatively high degree of intrinsic motivation and active power companies, grid managers and suppliers. However, following last year, large investments in electric mobility were announced, primarily in countries where the intrinsic motivation for electric mobility is partly determined by the automotive industry. To illustrate, the German government very recently announced additional investments of 1 billion Euros in electrically driven motors, on top of its original policy package (May 2011), and China, France, the United States and Spain are also investing very large amounts in electric mobility. The Formule E-team, representing the Netherlands, has reinforced the position of the Netherlands as an attractive country for electric mobility and it is due to these joint efforts that we have succeeded in supplying electric vehicles to the Netherlands. The Dutch tax benefits for the purchase of electric vehicles are favourable. In contrast to other countries, the Netherlands does not have a Launching Customer schemes, but even with its complete package, it does not automatically mean that the Netherlands will come out ahead of the other countries. The arena is constantly changing and we must continue to convince the manufacturers of electric vehicles in the coming years that the Netherlands is an attractive option, competition-wise, otherwise the vehicles, which are still scarce, will be supplied to other countries first and we will fail to achieve our objective of a becoming a large-scale, international test bed. Concerted government action involving electric mobility, a rapid rollout of infrastructure and an innovative business sector, supported by knowledge institutes and government, remain essential to prevent failure.

¹ For the calculations of the Total Cost of Ownership Please also see the Rai-association website for the Platform Elektrische Mobiliteit. TCO calculations of more than 20,000 kilometres per year reveal that electric (passenger) cars are not competitive yet. A competitive TCO only comes into view at far greater mileages.

² Squarewise May 2010, *Elektrisch rijden Internationaal de stand van zaken*.

1.4 Innovation project for electric transport

We have entered a new phase, in which we are scaling up the introduction of the electric car. With innovative processes and product launches, it is customary to measure the progress of the introduction on the basis of an S curve. If we extrapolate back from 2020 to the present using the S curve, we can conclude that we are now in the launching phase of a product that is, in theory, technically operational. The first objective that we need to achieve is a test bed in which we can field test its applicability on a relatively limited scale in the market, which will be the foundations for application on a larger scale. Now we need to meet the preconditions necessary for this continued growth, an important reason for the government to stay involved.



Figuur 1: prognose marktontwikkeling elektrische auto (Ministeries van I&M en EL&I, 2009)

[Market share of electric vehicles in new car sales (in %)- year

Figure 1: prognosis of the market development of electric cars (Ministries of Infrastructure & Environment and Economic Affairs, Agriculture & Innovation, 2009]

The government –both the national government and other government authorities – have a profound influence on the facilitation of applications and the elimination of obstacles in the preliminary stages of market development and the national government could make significant contributions specifically to market formation, by facilitating and providing referential frameworks.

1.5 Objectives and strategy for 2011 - 2015

If we adhere to our ambition to have 200,000 electric vehicles on the road by 2020, and a continued growth to a mature market of 1 million vehicles by 2025, it means that we must demonstrate, by means of the test bed, that the system of electric mobility works. This will require 20,000 electric vehicles, and means that the preconditions must be in place, including an adequate charging infrastructure, a thriving market and, of course, that safety, in the broadest sense of the word, is guaranteed. This phase may have the following effects:

The anticipated contribution of the 200,000 electric vehicles to the various public interest is:

- Savings of 0.5 PJ in power .
- A reduction of 0.5 MTONs in CO₂ emissions.
- An improvement in the quality of life in town centres and inner cities (air quality), because NO_x emissions will be reduced by 50 tons and fine dust emissions will be reduced by 10 tons.
- An improvement of the quality of life in towns and cities because the vehicles will

- produce no emissions and therefore do not need to be excluded from the towns.
- Less dependence on fossil fuels, making a difference of 1 million barrels of oil; another aspect that is as least as important – there is an alternative: electric mobility.

To obtain the best possible results with the available means and manpower, we have selected three spearheads to give more focus to the strategy.

1) Focus areas (discussed in more detail in chapter 2)

We want to find more efficient ways of stimulating electric mobility, so we need to boost it in areas where it has the most viability. The benefits of electric mobility are greatest in places where its contribution to air quality and the quality of life is most noticeable, i.e. locally, more specifically, in the larger towns and cities. There are also good opportunities to be found in the places where there are clear links with research and education, or economic development. The government is concentrating on these areas and calls them focus areas, on the theory that by concentrating on these focus areas, electric mobility will snowball.

2) Viable segments (discussed in more detail in chapter 3)

At present, electric mobility is not a feasible option for everyone, which is why we have decided to use a targeted approach, using viable market segments for which, in the coming years, we can draw up a watertight business case in terms of Total Cost of Ownership.

3) Boosting earning potential (discussed in more detail in chapter 4)

Electric mobility is a global development and will make a substantial contribution to sustainable economic growth in the coming years. We can reinforce our competitive position if we boost the Dutch business sector effectively, and consequently boost employment and increase the volume of turnover.

A generic policy package supports these three spearheads **(discussed in more detail in chapter 5).**

2 Focus areas

2.1 Acceleration by means of concentration

It is essential in the scale-up phase, i.e. the period between 2011 and 2015, to link small-scale projects and current test beds from the preliminary phase to each other and to expand them. If the foundations are sound, a targeted approach will ensure the continued rollout of electric transport. Combining forces means returns to scale, causing a critical mass. Accordingly, we have decided to use focus areas in “Electric mobility get up to speed”: evident areas that can be pointed out on a map of the Netherlands and in which the parties involved, including the national government are collaborating on a number of coherent aspects of electric mobility. A number of areas are already evolving as focus areas: the metropolitan region of Amsterdam, the city and environs of Rotterdam, Utrecht, Brabant and Friesland.

Some interesting experiments are being carried out in a number of other regions (Limburg, Arnhem/Nijmegen, Zeeland). Where necessary, the government is intervening to create a focus area; it is ensuring that at least two specifically transnational



focus areas (Nordrhein-Westfalen and, Flanders) are created. Each focus area is to develop a range of activities that are mutually coherent. The focus areas have a number of common features (all regions are focusing on the introduction of a charging infrastructure and have ambitions involving the numbers of vehicles; they have all met the necessary conditions, including an active local government and active businesses and institutions) and a number of features that make them unique, due to their focus on specific market segments or other economic opportunities.

Amsterdam Electric:

A project launched by the municipality of Amsterdam and a number of partners to promote electric transport. In 2010, Amsterdam set aside 3 million Euros for a funding scheme to buy more than 260 electric vehicles so that, in the short term, more journeys are made within the city using electricity.

The aim is to have 10,000 cars on the road by 2015, or 5% of the mileage in the city, driven by electricity. Part of the work has already been completed and Amsterdam holds the lead in terms of infrastructure and the visibility of electric transport. To maintain its lead in the coming years, Amsterdam will dedicate its efforts to building an infrastructure that provides coverage of charging points throughout the city and to boosting the purchase of electric car for frequent drivers in business.

Measure implemented by Amsterdam:

- The municipality of Amsterdam is collaborating with car manufacturers and others to organise the launch of new models in Amsterdam.
- Additional funds have been set aside for charging infrastructure in public areas, and for installing charging points into multi-storey car parks and on company premises.
- In 2010, incentive schemes for the purchase of electric cars by entrepreneurs became effective, whereas in 2011, the focus is centred on business frequent drivers such as taxis and distributors.

The government and its partners will discuss the range of activities with each of the regions to identify which local parties can, and should, have an active part, which market segments are important and what their potential scale-up could be, what infrastructure is required and how it should be rolled out, how to increase the visibility of electric mobility to the viable focus groups and how the earning potential in the regions can be boosted.

We intend to make material agreements with each region, in which the collaborating parties lay down their ambitions for 2015 (starting with the types and number of vehicles and the number of charging points) and stating who is responsible for what, when it is to be delivered, who is to supply/contribute what (manpower and means) and whether government assistance is necessary or desirable.

Accordingly, this will produce a specific package of government actions and assistance for each region. The aim is to have all the agreements signed within twelve months, starting with the first five in 2011. The government is charged with the responsibility of monitoring their progress, and should intervene where necessary to guide and speed matters up. Combining the activities that involve electric mobility in a number of focus areas in the Netherlands will intensify the support for the projects, and accelerate the development of electric mobility in the region. We expect that the rise in activities involving electric mobility will have a favourable effect on the surrounding municipalities.

2.2 Activities outside the focus areas

The emphasis on the focus areas does not mean that no initiatives outside these areas will be facilitated; it is important to share knowledge and experience outside the focus areas as well and these projects will be supported according to means.

Sharing knowledge with the rest of the Netherlands

Activities involving electric mobility will be organised outside the focus areas too, while the focus areas will be able to assist the acceleration of activities in other regions because they are trail-blazers, clearing the way for a scale-up. Lessons learnt from the obstacles faced by the first projects will be applied to subsequent projects. The national government will monitor the projects in the focus areas so that any obstacles can be analysed and prompt action can be taken where necessary. The experiences of the focus areas can be collected and disseminated among the other areas.

Lead tables

Open communication can stimulate municipalities outside the focus areas to promote at least a few aspects of electric mobility within the municipality, such as appointing a contact for electric mobility and assisting companies in the municipality. Municipalities that meet these conditions will be awarded the title “Electric Mobility-friendly municipality” by Natuur en Milieu and municipalities that do more will be compared in lead tables, after which the best ones (excluding the focus area) will get a special mention.

Action points

- Enter and fulfil contracts with at least five to ten focus areas
- Monitor and share the knowledge acquired from the experiences of the focus areas
- Share the knowledge with the rest of the Netherlands

3. Viable market segments

The beginning of the scale-up phase is also the right time to make electric mobility suitable for a number of specific market segments. In this period, a market segment is deemed viable if we can draw up a business case that is watertight in terms of Total Cost of Ownership. Viable market segments feature:

- vehicles with a high mileage (because electric vehicles have high fixed costs and low variable costs);
- many journeys within a certain radius, in relation to the range of action and charging requirements;
- benefits to the local environment, particularly to the quality of the air. TNO research indicates that using zero-emission buses can make a difference to a number of current ‘hotspots’ in the NSL (Dutch for National Air Quality Cooperation Programme).
- Awareness due to Corporate Social Responsibility.

Viable market segments are to be found in the areas of:

1. Logistics & distribution;
2. Commercial mobility and commuter traffic;
3. Mass transit: public transport, taxis, hire cars and pooling cars;
4. Company vehicles, including rubbish trucks;
5. Government vehicles.

In this phase, the viable segments will be actively stimulated; each market segment has its own specific obstacles and requires specific measures, while the use of electric vehicles requires the owners to consider new ways of making returns on their investments and new “business opportunities”. In the preliminary phase of this project, the initial experiences with these market segments were gained from the test beds.

Logistics

Cornelissen Transport BV is investing in electric distribution vehicles as part of the Cityshopper project; the vehicle will be used for delivering supplies to supermarkets and other types of distribution within towns and cities. The various goods flows towards the metropolitan region of Arnhem - Nijmegen will be consolidated and delivered to the town centres.

Business Mobility

Utrecht's GreenCab Test Bed Project aims to help partners experience electric transport on a large-scale. 40 GreenCab taxis will be introduced to the streets in 2011 and this test bed project, the only one of its kind in Europe, uses electric cars intensively and on a large scale and will provide understanding of their maintenance, susceptibility to break-downs, battery management, consequences for the power grid and logistics.

Government

In the short term, the Directorate-General for Public Works and Water Management (RWS) intends to accumulate knowledge of setting up an energy – neutral and emission-neutral transport system and has accordingly launched the e-mobility programme “e-rijden” that focuses on operating electric vehicles and licencing charging points along motorways. RWS is examining the applicability of, and public opinion on, electric vehicles in an “in-house” practical test and aims to have 25 % of its fleet running on electricity by 2015.

Collective/mass transport

Prorails's Proov stands for innovating, connecting and accelerating mobility. Stations are vital links in a “green” and comfortable journey, nexes where man and media meet and towns and cities unite. Prorail's network allows every traveller to travel by train, from close to home and close to his or her destination: travellers can choose to travel by electric bike, scooter, car, bus or taxis to and from the station.

The projects have produced insight into the opportunities and obstacles in these segments and the challenge is now to scale up these successful examples. In this phase, our strategy is to concentrate on stimulating the market segments by making the opportunities transparent and by eliminating the obstacles efficiently and systematically.

We intend to treat the market segments in the same way as the focus areas, i.e. by making material agreements with the most important parties in each viable market segment to lay down the ambitions for 2015 regarding vehicle numbers, the obstacles requiring elimination, who is responsible for what, what is to be delivered, who delivers/contributes what (manpower and means) and what government assistance is necessary or desirable.

An illustration of this strategy is the licencing renewal in the public transport sector: a joint initiative launched by public transport bus companies, bus manufacturers, financiers, local governments and knowledge institutes and aimed at emission-free and affordable, good quality public transport. In the long term, the intention is that 5,000 buses, the entire fleet of public transport buses in the Netherlands, are to have zero emissions and yet remain affordable; this requires change in three factors:

- *An alternative power supply for buses* by means of efficient bus drivelines without pollutant emissions. This necessitates the study of electric drive using batteries, by means of inductive charging, or using hybrid or fuel cell buses.
- *An alternative set-up for funding the power component* in the bus fleet: to make returns on the large and necessary investments, the investments themselves need to be of a suitable volume (returns to scale) with an appropriate depreciation period.
- *Alternatives for organising public transport licencing*; which requires a review of the present method for organising licencing and the BDU system of funding of public transport.

As part of the Green Deal, the consortium of concerted parties intends to draw up a manifesto with the Ministries of Infrastructure and the Environment and of Economic Affairs, Agriculture and Innovation to tackle this plan in a public-private collaborative partnership. The parties in question are the KNV (Royal Netherlands Transport), the FMN (de Federatie Mobilieitsbedrijven Nederland

[Dutch Federation of Mobility Companies]); the banking industry, the manufacturers of public transport buses represented by RAI association; D-incert (Dutch Innovation Centre for Electric Road Transport) and local governments.

Action points

To draw up at least five action programmes with the stakeholders who are directly involved, to achieve a scale-up in the viable market segments: distribution, business market, mass transit, company vehicles and government.

4. Economic opportunities: taking advantage of the earning potential in the Netherlands

Electric transport is a new market full of economic opportunities for the Dutch business sector and with the right focus and approach, the Netherlands could position itself successfully in Europe. The recent period has demonstrated that Dutch companies and knowledge institutes are busily engaged in developing innovative technology and products and in introducing solutions to the market. The government has supported this by means of the innovation programme for High Tech Automotive Systems (HTAS-EV) and similar programmes.

4.1 The earning potential for the Dutch economy

Until the year 2015, the market for electric transport and smart networks will be unstable but viable. Roland Berger estimates that the total market value of the manufacture of electric vehicles (EV/PHEV) in Western Europe will be between € 30 and € 100 billion in 2020, on the basis of 4 to 5 million electric vehicles.

Numerous companies and government authorities, in both European and non-European countries, have responded actively to the economic opportunities provided by electric transport. In this arena - if we apply our accumulated knowledge and competencies, market features and experiences - the Netherlands could be a successful player.

Dutch industry has acquired a solid position in battery management, charging facilities and decentralised electric drives. The knowledge base for rapid charging, power electronics and power grids is very solid, and in addition, the Netherlands has a secure knowledge position in system design that integrates the complex mechanical and electric components and is in great demand in this market. New economic activity and more jobs are specifically expected in manufacturing components and (battery) systems.^{3 4} The market volume for electric components is estimated to be somewhere between € 10 and 25 billion, and the Dutch market share for the manufacture of vehicles and components is between 1 % and 3 %, which, according to Roland Berger, will be the equivalent of € 0.5 – 3.6 billion annually in 2020, while HTAS assumes approximately € 3.5 billion turnover in 2020. Employment is expected to rise to 1,500 (immediate) jobs in 2020 manufacturing components, systems and vehicles, and may even increase to 7,800 jobs. Due to the arrival of foreign companies and the construction and running of charging points, structural employment could even grow to approximately 13,000 jobs, although these estimates have not taken a possible effect of recession into consideration, though we expect that to be small due to the growth of the total automotive market.

³ Ecorys (2010), *Versterken Duurzame Energiesector*

⁴ Squarewise (2010); *Impact van Elektrisch Rijden op de Nederlandse industrie.*

Electric vehicles specifically require new types of components and systems, rendering certain conventional components useless. The expectations are that particularly newcomers to the automotive market will profit, as suppliers, from the growth of electric mobility⁵. Furthermore, some of the current suppliers will benefit from the growth in this new segment of the sizeable automotive market; the Netherlands has a healthy and innovative automotive group consisting predominantly of suppliers who export more than 80 % of the turnover, producing between around 30,000 and 40,000 jobs.

There are more than 200 companies in the Netherlands operating in the arena of electric transport, including some top players such as ACTIA, Mastervolt, Nedap, Philips, Epyon, Alfen, KEMA, TomTom and many enterprising SMEs. In addition, there are several OEMs operating in niche markets (including Spijkstaal, Gemco and VDL Bus) and some companies that convert conventional vehicles into electric ones (AGV, Innosys Delft and Electric Cars Europe). Many of the companies we have listed are already collaborating with knowledge institutes such as TNO (including Campus in Helmond), the technical universities and several universities of applied science.

Dutch players, often small companies, are only viable in this strongly competitive and international arena if they can focus on the niche markets or make their mark in some other way. These niche markets need to be identified if we are to design an adequate market strategy. Accordingly, the government has commissioned the Dutch Innovation Centre for Electric Transport (D-incert) to design a number of roadmaps, which jointly constitute the national knowledge and innovation agenda for electric mobility in the Netherlands, providing insight into niche markets that offer economic opportunities for electric mobility. Integral electric mobility, smart charging and electric-powered boats are regarded as viable niche markets.

Recently, the Formule E-team and HTAS collected the extensive knowledge and skills that are present in the sector together on a national level. Parties are strongly in favour of collaborating to set up a technological platform, providing a showcase to reinforce the positioning of Dutch industry. One way of combining innovation power and focusing on the mid-term to long term is to develop proof of concepts for essential component systems for the Dutch automotive industry⁶.

Research into batteries is part of the ADEM programme (Advanced Dutch Energy Materials Innovation Lab), a project set up by the three technical universities and Netherlands Energy Research Centre (ECN), although, so far, the programme has not been able to meet to the precondition of adding a private contribution of 10 per cent (€ 3 million) to the €30 million contribution from EL&I. ADEM can proceed as soon as that has been achieved.

In addition to the industrial opportunities, the Netherlands also offers options as an ideal testing environment for electric mobility and preparations have already been made for test centres for electric transport, as these deviate greatly from test centres for conventional vehicles. Lastly, we should not forget to mention the opportunities provided by “second life” applications and the recycling of batteries.

4.2 Government incentives and assistance

The Dutch business sector and the national government recognise the economic opportunities provided by electric transport, although, obviously, it is up to the business sector in particular to capitalise on them. By taking appropriate action, the government can create the right preconditions,

⁵ Squarewise (2010);

⁶ Squarewise (2010)

allowing companies to operate optimally and inviting foreign companies to open branches in the Netherlands, in accordance with the Cabinet's new approach to the policy for trade and industry.

Interface with the top sectors

The Cabinet's approach centres on nine top sectors, of which the top sector High Tech Systems is particularly relevant to electric mobility due to the links with such fields as materials science, nanotechnology and robotics. Other important top sectors are Logistics (technology transition for smart mobility and Energy (power transition, smart grids and a sustainably constructed environment).

Funding innovative companies

Viable innovation projects with high-risk profiles in areas such as that of electric transport sometimes need financial backing. In the Netherlands, the market for informal venture capital is less well developed than in the English-speaking countries. Accordingly, part of the new policy on trade and industry is to set up an Innovation Fund, with which successful innovations can repay the returns on their investments, making means available for funding new initiatives. As a consequence, entrepreneurs will be able to invest more easily in profitable (sustainable) products, services and processes. This Innovation Fund will improve the access to capital for companies that invest in innovations, by means of innovation credits, by giving guarantees to financial intermediaries and by participating in investment funds. Both the government and the business sector will join forces to fund new trail-blazers, HTAS projects, projects for infrastructure and services wherever possible on the grounds of current test beds, consortiums and clusters.

Incentives for collaboration

Collaboration between the business sector, knowledge institutes and the government is the key to successful entrepreneurship and the development of new markets, and this was demonstrated by the first Action Plan for electric mobility. A mutual vision and a clear-cut action plan allow action to be coordinated and taken, and the Cabinet has assigned this collaboration between the government, the business sector and knowledge institutes a prominent position in its policy on trade and industry. As we mentioned above, companies operating in the arena of electric transport need to work together more often, for instance, to produce a technological platform and proof of concepts as a show case to show to OEMs and to reinforce the positioning of Dutch industry. The scheme for Innovation Performance Contracts (IPCs) could be useful here: it is a scheme, extended in 2011, to help groups of SMEs to jointly carry out long-term innovation projects. Another possibility is to subsidise an exploratory study into (international) collaboration. In 2011, the budget amounts to € 26 million and is to be awarded by means of two tenders; the next one is to be called on 1 November 2011.

Improving the education-labour market interface

Just as various other industrial sectors, this sector has a structural need for well-educated technical staff. Institutes for vocational education are being called upon to specialise more specifically by means of Centres of Excellence and Centres for Innovative Skills.

In early 2011, the Cabinet adopted the proposal submitted by the Automotive Centre of Expertise (ACE). HAN University of Applied Sciences and Fontys University of Applied Science are to collaborate with the industry to improve the quality and the quantity of the outflow of students and to dedicate more to open innovation, entrepreneurship and "knowledge valorisation", working with businesses to develop and apply new know-how. It also supports the centre for Innovative Skills on the HighTech Automotive Campus in Helmond, where senior secondary education is fortified by businesses.

Utilising economic diplomacy

To fulfil its ambition to become an international test bed, the Netherlands will have to make itself more visible by focusing more specifically on its international contacts. The Netherlands' economic opportunities can be reinforced by promoting Dutch trade and industry abroad and by demonstrating that its business climate is favourable to foreign investments (head offices, collaboration projects, manufacturing locations) specifically from global leaders such as China and the United States, and actively committing to actual cases.

In November 2010, the Formule E-team invested in contacts with China. In collaboration with the Netherlands Foreign Investment Agency (NFIA), Technical Scientific Attachés (TWAs), embassies, the business sector and knowledge institutes, contacts with countries such as China, the United States, South Korea and Japan will be intensified in the coming years.

Stimulating market development

The government is assisting the development of the market for electric transport on national, provincial and municipal levels. It facilitates the construction of a charging infrastructure, stimulates familiarity with electric mobility, participates in projects and facilitates and clusters high-quality know-how and activity.

North Brabant

In 2009, cluster organisations, campuses, the sectors and knowledge institutes joined forces to review the options for putting 200,000 electric vehicles on the road in North Brabant.

The pilot project "Electric transport from door to door" was launched, in collaboration with the municipalities Enexis, Essent, Greenwheels, Arriva and NS, in March 2009. Enexis and Essent provided vehicles, and a public charging infrastructure was installed, electric car-share cars such as Greenwheels, transport and scooters were put into operation and three completely electrically powered buses were introduced for use in the centres of the towns.

In collaboration with the leading municipalities such as the five larger towns of North Brabant (Brabantstad), 10 additional projects are being conducted in which innovative products and services are introduced to the market. This ranges from development and implementation of inductively charged buses for public transport, electric urban cleaning, innovative car pooling projects, the development of range extenders to a smart-charging project with Better Place and Enexis.

The development of electric mobility in North Brabant is driven by the market, and the added value of the Province is to facilitate the innovation-ecosystem by assisting in the identification of the demand, driving the cross-sector valorisation programmes and aligning the necessary company-oriented schemes (participation, revolving funds, etc.), with North Brabant actively encouraging collaboration between municipalities, businesses and knowledge institutes and supporting the continued development of the campuses and knowledge institutes involved.

Action points

- **Stimulate and facilitate the development of electric vehicles, particularly in niche markets by implementing instruments from the new policy on trade and industry**
- **Explore the option for setting up a common technology platform/showcase in conjunction with HTAS and other parties.**

5 Generic policy package

The government creates preconditions, on the grounds of which, spearheads, focus areas, viable market segments and the use of earning potential can crystallise. In this chapter, we shall provide a survey of the package of policy measures until the year 2015.

Sections 5.1 to 5.3 should be read in terms of preconditions: without favourable tax treatment, an adequate charging infrastructure and guaranteed safety, electric mobility would never become a reality. The remaining sections contain government measures that are essential for achieving the ambitions of this Action Plan.

5.1 Tax measures

The most important purpose of taxation is to fund government expenditure. As a significant side-effect, the specifications of the tax measures can support the national government's policy objectives, creating incentives to buy (very) energy-efficient cars. The precise specifications for the tax treatment of electric and semi-electric vehicles will have a considerable effect on the success of this Action Plan.

In June 2011, the tax system for car-related taxes, the "Autobrief" was submitted to the Lower House. It contains the following elements that are relevant in this context.

Addition for tax purposes The "Autobrief" proposes that the zero rate is applied to all cars with CO₂ emissions of 50 gr/km and lower, a standard currently met by fully electric and certain semi-electric vehicles. This amendment to the tax regulations is essential to the market development of semi-electric cars (cars with a range extender and plug-in hybrids) as incentives for semi-electric cars provide significant support for the proposed transition to zero emissions.

Motor Vehicle Tax (MRB). The present exemption from MRB for all fuel-efficient cars will be effective until 2014, but cars with emissions of 50 gr/km and lower will exempt until the end of 2015, two years later. The relative position of (semi-) electric cars in comparison to other fuel-efficient cars will consequently improve in the short term. Towards the end of this period, we shall review whether continuation is desirable. Furthermore, we shall need to decide how the greater weight of the battery pack in (semi-) electric cars can be included in MRB in the future. Currently, a flat rate of 125 kilograms is deducted from the weight of the car to determine the basis for MRB and this weight will be adjusted to the average additional weight for cars of this category. This fixed rate will obviously only be relevant for determining the basis for MRB if these cars do not qualify for the exemption.

Private Motor Vehicle and Motorcycle Tax (BPM). The limits for exemption from BPM are to be reduced in a number of steps from 110 gram/km for petrol-fuelled cars and 95 gram/km for cars that run on diesel to 83 gram/km for all fuels. For electric and semi-electric cars, this means that the current exemption shall remain fully in effect until 2018, while the more stringent BPM exemption standards only concern non-electric cars.

MIA/VAMIL. Present facilities shall be continued.

This package contains incentives for the most efficient (semi-) electric cars.

5.2 Power, charging and payment infrastructure systems

A physical charging infrastructure is essential for scaling up the introduction of electric vehicles successfully. A market for charging and payment services will evolve, involving the supply of "plug and pay" facilities. For the government, it is important that this market meets the preconditions in such a way that it protects the public's interests. Both the availability of the charging infrastructure and a healthy "plug and pay" market are preconditions for scaling up the introduction of electric vehicles successfully.

Availability of charging infrastructure

A charging infrastructure must be available if electric transport is to be appealing to the public and win the public's wide acceptance. The governments' vision to guarantee this availability is set out as follows:

- The charging infrastructure will be rolled out gradually as electric vehicles arrive on the market. In the focus areas, the rollout of the charging infrastructure will be done slightly in advance of the number of cars, avoiding the "chicken and egg" situation;
- The rollout of the charging infrastructure must meet the demands of the drivers. We know that the vast majority of cars are charged in the vicinity of the home or the workplace;
- The rollout of the charging infrastructure must be done on both public and private land, although the public land should receive more attention as 70 per cent of the Dutch do not own any private land;

- The charging infrastructure must match the needs of the focus group (non-residential transport, fleet owners and private individuals clearly have different charging requirements);
- Incentives for viable innovative charging technology (such as rapid chargers, battery swapping and inductive charging) by means of current (EU-)programmes;
- In this phase, the rollout of the charging infrastructure will primarily centre on the focus areas.

A profitable business case has yet to be made for the public infrastructure, but we have noticed that, due to the initiative of power grid managers in the E-laad Foundation and active municipalities such as Amsterdam, important foundations are being laid for the public infrastructure.

E-laad Foundation

The foundation E-laad.nl is a project set up by the cooperative grid managers in the Netherlands to stimulate electric transport and to collect information on the charging behaviour of electric drivers and aims to have 10,000 charging poles installed by 2012.

The E-laad Foundation will support tendering for charging poles in focus areas, and will also support applications from individual e-drivers and municipalities as well as from the focus areas. Depending on the demand, E-laad will give recommendations on, or organise the installation of, charging infrastructure in public spaces.

Before a municipality decides to install a charging point, a decision-making process is required within that municipality. To streamline this process for the municipalities and to keep the work for the individual municipalities to a minimum, the Association of Netherlands Municipalities (VNG) will help to draw up standard procedures for the decision-making process for charging points.

There is no profitable business case for rapid charging points either. Nevertheless, we have noticed that many different market players have already installed rapid charging points. The expectations are that between 25 and 40 rapid charging points will have been installed in the Netherlands by the end of 2011; this network is crucial for overcoming range anxiety, the fear of not being able to reach a destination before the battery runs out.

The development of a market model for plug and pay services

A plug and pay market will evolve and a model, commissioned by the government, has been designed to demonstrate what the structure of a plug and play market should ultimately be. This model is explained in more detail in appendix 2. This model guarantees that all interested actors will be able to acquire a position in this market, guaranteeing competition and innovation. All the stakeholders have said to be in favour of this model. A mature market model and the corresponding common agreements (on data exchange, interoperability of systems, payment traffic) contribute to more efficiency, more competition and better service for the customers. The market players will join forces to continue to develop the market, stating how and in which term they aim to achieve this. The government will monitor and facilitate the process and in doing so, will protect the public's interests: healthy competition (the rules of this market are to produce as much freedom of choice as possible for both the end users and players in the chain); open access to infrastructure and systems (which encourages innovation, high-quality service and competitive pricing); consumer interests (ease, uniformity, interoperability, transparency), guaranteed supply (power must always be available); quality (facilitating competition primarily on the service level, instead of on the scale of the network); safety (standardisation, standards); and efficient market structure and supervision (the division of roles and responsibilities among the domain of charging services and the domain of power supply must be evident and the order must produce cost-effective services for society, with as much self-regulation as possible, to avoid the need for more regulations and enforcement).

The preconditions for the continued development of an optimally operating market model were approved in 2010 by all the parties and are the foundations for further elaboration of a common system of agreements. In spring 2011, all the parties joined forces to draw up a master plan/roadmap, which focused on a pragmatic approach to all matters of critical importance for

developing an effective competitive market for charging services and a charging infrastructure. Agreements on interoperability are an illustration of a high-priority issue. This phased process is expected to be complete on 1 January 2013, if all the underlying administrative systems are operational by then. Within this framework, the government aims to guarantee sufficient support for the agreements that are to be made and to speed up the progress, if necessary.

Grid load/ smart charging

The charging behaviour of large numbers of electric drivers will demand other things from the power grid. The challenge is to install the infrastructure as (cost) effectively as possible to meet the demands of the users while guaranteeing the power supply.

Grid managers do not foresee any bottlenecks in the period up to 2015, although the market players have observed that smart facilities will be required in the period after 2015 to avoid costs to society for grid reinforcement and to offer more scope for innovative services to e-drivers. A special Taskforce has studied this issue: the Taskforce for Intelligent Grids. As this Taskforce⁷ has indicated, electric transport and smart grids mean drastic and interrelated changes to the system. Without the smart grids, serious problems could arise on the grids and the peaks in the demand could lead to additional investments in the versatile production capacity of electricity. This could pose obstacles for electric transport and cause delays in its implementation. Accordingly, smart grids are necessary to take the best possible advantage of the benefits to society produced by electric transport. At the same time, electric transport offers the opportunity to create more versatility in the power system. With the aid of smart grids, peaks in the daily demand for power can be levelled with smart charging, making it easier to fit wind power and solar power into the power system and making them economically more attractive. The Taskforce' first recommendation was to set up test beds for smart grids, specifically to see how consumers became involved and responded to the options – such as price incentives – created by smart grids.

The government has adopted this recommendation and aims to launch another five to ten projects, having set aside € 16 million in subsidies for them. The projects involve various applications for smart grids, of which electric transport using smart charging is one of the most important. This Action Plan aims to have electric mobility included as part of at least two of these test beds.

5.3 Safety guarantees

The government will guarantee the safety of electric vehicles by means of regulations, incident management and training courses, which will be described below.

Regulations

Various aspects of an electric vehicle mean that the current legislation and regulations that focus on conventionally powered vehicles cannot be applied to electric vehicles without any adjustments.

⁷ <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2010/09/02/op-weg-naar-intelligente-netten-in-nederland.html>

TNO/KEMA/RDW research has revealed that there are certain safety aspects associated with the electric driveline. More specifically, safety aspects concerning the admission requirements and requirements for the series approval need to be addressed. The amendment to the Vehicles Regulation, effective from 1 April 2011, requires that vehicles that are submitted to the RDW for a national single or small series-approval (including any modifications to the construction after registration) must comply with more stringent admission requirements. The current draft of the Vehicles Regulation also states that electric mobility vehicles must be inspected on a specific number of points during the periodic motor test (APK) as of 01-04-2012. In addition, on a global level (Economic Committee for Europe), agreements are being made on the lack of noise emitted by electric vehicles travelling at low speed (below 30 km/hours). In the future, it is likely that quiet vehicles be equipped with an extra sound to warn other road users of their approach.

Incident Management

We shall join forces with the emergency services and the suppliers of information systems to study whether a procedure can be drawn up to describe which specific actions are needed in the event of an incident involving an electric vehicle. It is important to produce a comprehensive and open database in which the features of each electric vehicle are described, for instance, it is crucial to know how to cut the power off in an electric vehicle and which parts of the vehicle may not be “cut”.

Courses for mechanics and engineers

Working on electric vehicles requires specific knowledge of the operations of an electric drive. The sector, schools and educational training institutes have designed a training course geared specifically towards electric vehicles. Only garages with qualified staff may sell and maintain electric vehicles and the RDW will produce an educational module in 2011 for staff involved in APK and vehicle admission.

5.4 The government as a lead customer

The government as a lead customer ties in with its ambitions of sustainability and in its role of road authority, the government can challenge the market to provide new solutions for innovative charging points and to set up test beds for charging points along stretches of road. The purchase of electric transport can be stimulated by government involvement in test beds, by formulating objectives for the purchase of electric transport, the development of guides for draft contract documents that facilitate the purchase of electric transport and the inclusion of supply and demand for electric mobility in the sustainable procurement showcase that is to be developed.

The national government already has a number of concrete projects, such as the Government Programme for Business Sustainability (DBR), which supports electric mobility by incorporating it in the government’s sustainable operational management. One of the activities is the installation of charging points for electric vehicles in the vicinity of all government buildings. The Directorate-General for Public Works and Water Management facilitates electric mobility on national trunk roads and is currently testing the applicability and financial consequences of electric cars in its fleet by field-testing 26 electric vehicles.

The government also commissions the purchase of innovative products and services and the Cabinet wants to use its procurement budget more actively for applying innovations to solve its problems and to ensure that the innovative SMEs are given more chances of tendering, by means of schemes like the Small Business Innovation Programme (SBIR).

In the course of 2011, we shall review whether the role of the government as a lead customer can be expanded and the sub-national authorities in the focus areas shall also be called upon to become lead customers.

5.5 Incorporating monitoring and research

In 2011, after consulting prominent knowledge institutes such as ECN, TNO and PBL, we are to draw up a long-term programme within the present financial framework. Research may help decide how to stimulate electric mobility in a (cost) effective way. In addition, it is important to register the experiences gained from test beds; the performance of test beds depends on the extent to which lessons are drawn from experiences in various demonstrations, and to what degree these lessons are shared so that new projects and parties can benefit optimally from them.

Various lines of research are relevant:

- Research into user preferences and behaviour and options for influencing these factors is essential for the successful launch of electric mobility on the market and for a suitable charging infrastructure; the behaviour can be monitored in test beds, and is necessary because there is often a large difference between what people say and what they actually do.
- Technology-related research can identify opportunities for the Dutch business sector. Knowledge of technical developments is necessary to formulate the innovation policy adequately and to assess which parts of the overall transport market can be served with electric vehicles and which role alternatives could assume.
- It is useful to monitor the development of the costs of critical components closely so that it is easier to determine which financial/tax incentives are needed to make electric vehicles more attractive to different user groups.
- The net effect of stimulating electric mobility on CO₂ and other emissions is affected by interaction with national and EU policies. In addition, very little is known about the practical use and emissions of plug-in hybrids and electric vehicles and there are questions concerning the manufacture and processing of batteries and other critical components, both in terms of impact on the environment and the scarcity of materials.
- Administrative research: how can the government organise its efforts most effectively?

5.6 International collaboration

International collaboration, necessary to achieve the Dutch ambition to increase the visibility of electric mobility and to present the Netherlands as an attractive international test bed, will be intensified during the next four years

Intensifying EU collaboration

A smooth introduction of electric vehicles requires the promotion of a coherent European policy with the right development of common EU values and standards. Accordingly, the Netherlands will dedicate its efforts to:

- The standardisation of the charging infrastructure (plugs, communication protocols, payment systems, etc.). The CEN Cenelec intends to have completed the current discussion on standardisation and the delivery of a common EU standard by the end of 2011.
- The European policy on sources presented as CO₂ values for cars and vans, as this is a significant driving force for zero-emission vehicles at the supply end of the market. If the current standards for cars (130 g/km) are made more stringent, reducing them to 130 g/km in 2015 and to 95 g/km in 2020, and this, in combination with a system of fines, will gradually encourage car manufacturers to include zero emission vehicles in their range and sell them on the European market. This will be reinforced when the 2020 standard is tightened even more in 2025, to 70 g/km for example. The Dutch efforts in Brussels are concentrating on this latter aspect.
- Stimulating innovation by better collaboration in R&D. In the coming period, the focus will be on the 8th Framework programme and the development of the Strategic Transport Technology Plan (STTP) which is to combine the various R&D initiatives on a European level more efficiently.
- Dovetailing with relevant EU projects and initiatives such as:

- Electromobility+, an initiative of 13 European countries and regions which contributes to the European Green Cars Initiative. The initiative, set up as part of ERA-NET Transport (ENT), concentrates on joint research that is to produce sustainable foundations for the development of electric mobility in Europe; the project is coordinated from the Netherlands by the Ministry of Infrastructure and the Environment.
- CARS 21 (Competitive Automotive Regulatory System for the 21st century), an EU-advisory platform with a focus on increasing the competitive capacity of the automotive industry.
- Green E-motion project (a 4-year EU-demonstration project aimed at the exchange of knowledge and experience between 42 partners from the industry, towns and cities and knowledge institutes).

2011 saw the launch of the European project ENEVATE; the consortium of the project consists of 15 partners from 6 countries (the Netherlands, Belgium, France, the United Kingdom, Germany and Ireland) that represent the different links in the value chain, such as power, infrastructure, the automotive sector, knowledge institutes and the regions. The Dutch automotive cluster organisation, the Automotive Technology Centre (ATC) is the mouthpiece for this consortium; the aim of the European project ENEVATE is to support and facilitate the acceleration of electric mobility in Northwest Europe.

The active use of EU grants and relevant funds also deserves more attention: information on European opportunities will be actively distributed among the players, and initiatives that are viable for European co-funding are being explored, by means of appointing National Contacts for the European funds in the Netherlands, for instance.

Transnational partnerships

Transnational partnerships are essential if people wish to travel across border by means of electric mobility. This could reinforce consumer support – necessary for a large-scale rollout of electric transport. Transnational partnerships will also help the different countries find more mutual understanding in terms of policy, which will accordingly encourage the development of common European values and standards.

In coming years, more attention will be paid to the development of transnational test beds, particularly with Germany, Belgium and France. On the subject of Germany, a recent collaborative project was launched with the NordRhein Westfalen region. The agreements on the collaboration between both countries will be ratified in 2011, in a Memorandum of Understanding between the parties in question, including industry, the business sector, local governments and knowledge institutes. We expect results pertaining to charging infrastructure, batteries, safety and technological collaborations. This test bed will undergo more scale-ups in the coming years.

Knowledge and best practice exchange

At present, countries like Denmark, France, the United Kingdom, Germany, Portugal, Spain, China and the United States are the most prominent leaders in electric mobility. In the appendix, we shall give a survey of the policy approaches adopted by these countries. The high levels of ambition and the policy approaches might serve as sources of inspiration for the Netherlands and in the coming period, the dissemination of knowledge and best practice exchange will be intensified by means of bilateral visits and exchanges within the EU and IEA frameworks.

Economic diplomacy

In the coming period, the topic “electric mobility” will be actively included on the international agendas for official visits and economic missions, focusing on:

- Presenting the Netherlands as a nation that is actively involved in electric mobility;
- Promoting Dutch trade and industry abroad, and

- Attracting foreign investments from leading nations such as China and the United States.

5.7 Communication strategy

The communication strategy for electric mobility in the period between 2011 and 2015 aims to acquaint the various focus groups with electric mobility, paving the way for a large-scale rollout on the consumer market in 2015.

Communication and the corresponding expectations management of specific focus groups and the public are crucial to the scale-up of electric mobility. Access to reliable and objective information on the current and future options for applying electric mobility is important to manage expectations, to achieve objectives and to avoid unnecessary disappointments. The stakeholders and partners from the Formule E-Team have an important part in this and provide adequate information to their supporters.

The communications strategy follows the following directions:

A. Communication strategy centres on focus areas

The Action Plan centres on focus areas and these have a similarly important part in the communications strategy, in accordance with the requirements of the focus areas. The information pertaining to the programmes is available on the central website, which serves as a portal and shall also refer to other relevant websites. Furthermore, the exchange of information between the focus areas will be a point of particular attention.

B. Communication via the stakeholders and partners from the Formule E-Team

Communications via the stakeholders and the partners from the Formule E-Team, including the ANWB, RAI, BOVAG, Energie Nederland, Netbeheer NL, VNA, Stichting Natuur en Milieu etc. will be sent via their own channels as far as possible. This flow of information shall be fuelled and supplemented by the government where possible.

C. Generic communication with other focus groups for presenting an image

The purpose of the generic communication is to provide public information for presenting an image: the information shall be made available in places where the public looks for it, like on the website. A pro-active media policy, the dissemination of inspiring examples/business cases and a consistence core message are pertinent to this aspect.

6 Organisation and funding

6.1 Organisation

The Formule E-Team (FET) has been promoting Electric Mobility in the Netherlands and accordingly, it features more prominently in the public eye. The combination of the participating organisations ANWB, BOVAG, Energie Nederland, ICToffice, Netbeheer NL, RAI association, VNA [the association for Dutch car lease companies], VNB [Association of Dutch Banks], and its figureheads – H.R.H. Prince Maurits of Orange, Ruud Koornstra and Minnemijn Smit – has proved to be a winning team in this pioneering stage.

For the next phase, the one described in this Action Plan, we shall review the organisational structure and adjust it where necessary, while considering the following aspects. The objectives of this Action Plan need to be primarily achieved in society, and the government's role in this is that of "enabler" and trouble-shooter: we make it possible so that others can do it - we clear any obstacles from the path. The focus areas (spearhead 1) and the viable market segments (spearhead 2) are at the centre of the rollout of electric mobility. We must learn from each other's projects, share our achievements and join forces to take on the challenges. Should any large problems arise, we must respond adequately. Accordingly, this Action Plan needs to establish a forceful and efficient programme

organisation who can act decisively but know when to leave responsibilities in the hands of those to whom they belong.

At present, the large majority of the stakeholders are united in FET (Formule E-Team), but it is important for the future that the stakeholders remain involved, as they have a part in such matters as monitoring the progress and the dissemination of the use and necessity of electric mobility. The government is to discuss the best form of organisation for the coming years with the stakeholders shortly.

6.2 Funds

A survey of the tax measures and means for the 2011- 2015 period:

- The tax benefits: BPM, MRB, addition for tax purposes, MIA/VAMIL.
- €9 million (see the chart below).
- Means available by successfully dovetailing with the top areas, the test beds, smart grids and other policy areas.
- Means from (European) subsidy schemes.

We shall discuss the first three in more detail.

The tax benefits for electric mobility with BPM, MRB and additions for tax purposes are explained in the Autobrief and in section 5.2 of this Action Plan; moreover, we shall assume that the current facilities for electric transport under MIA/VAMIL will be continued.

Expenditure of the €9 million

Chapter	topic	2011	2012	2013	2014	2015	Total
3, 4	Focus areas and market segments	600	600	600	600	600	3,000
5	International contacts & acquisition, international test beds	350	400	400	400	400	1,950
5	Communication, research & monitoring	550	500	500	500	500	2,550
6	Project organisation support & FET	300	300	300	300	300	1,500
	Total	1,800	1,800	1,800	1,800	1,800	9,000

Sums are x € 1,000

We are looking to interface with the top-sector strategy for the costs of reinforcing the earning potential, particularly with the top-sector *High Tech Systems and Materials*, and this also applies to funding innovation, research and education and backing companies (through the agency of the Innovation Funds, the IPC-scheme – with a total volume of €26 million in 2011 and to which projects launched within the framework of this plan may appeal - SBIR, loan guarantee schemes for the SMEs and GO).

We shall assess the options presented by the prevailing budgets for funding education, monitoring and support research.

Pilot projects for smart charging may be submitted under the Smart Grids test beds scheme for which € 16 million has been reserved (electric transport is one of the significant options).

Appendix 1. Market model for electric mobility.

This appendix presents an ideal market model, one the government would like to see evolving and of which the stakeholders have spoken favourably. In a market that is able to operate efficiently, the various market activities are distributed among the various market roles and every player has freedom of choice in respect of purchasing services and products and this applies to both the end users and the various service providers and other business parties in the chain. In previous market stages, it was very possible that certain market activities were attributed to one party. The aforementioned common agreement consequently serves to facilitate the mutual relations between the various parties in this model in the best possible way.

propositions

[Charge consumer – charge provider- service provider to charge consumer-service provider to charge provider

- 1. propositions from charge provider to charge consumer*
- 2. propositions from service providers to charge consumer*
- 3. propositions from service providers to charge provider]*

Figure 2: “plug and pay” market model.

Appendix 2. Approach to electric mobility presented per country

Country	Ambition regarding number of vehicles	Ambitions regarding charging infrastructure	International collaboration/ interesting projects	Government instruments
The Netherlands	2015: 20,000 2020: 200,000 2025: 1 million	10,000 public charging stations in 2013 + extensive network of private charging points 50 rapid charging stations	<ul style="list-style-type: none"> • Transnational test bed with NordRhein Westfalen • Knowledge and battery testing centre in Helmond • Initiator of the EU project ENEVATE • Participates in Green E-motion project 	<ul style="list-style-type: none"> • Test bed programme (€10 million) for the period 2009-2014 • Stimulation of construction of charging infrastructure and purchase via MIA/ VAMIL • Government contribution to research and development via the two HTAS tenders (€20 million) • Exemption from BPM • Zero-emission addition for tax purposes • Exemption from MRB
Denmark	2020: 500,000	150 battery changing stations ready before 2012	<ul style="list-style-type: none"> • Dong Energy – experiments with links to smart grids and electric mobility to make better use of wind • Dong Energy and company - Better Place – rollout of charging infrastructure 	<ul style="list-style-type: none"> • €4.7 million for test beds (2008-2012) • Large purchasing grants • Budgets for knowledge development (€75 million for sustainable transport, €190 million for the “Future energy systems”)
France	2015: 450,000 2020: 2 million	1 million charging stations ready before 2015 (both public and private)	<ul style="list-style-type: none"> • Collaboration with Germany] • ‘Working group Automobile’ 	<ul style="list-style-type: none"> • € 4 billion government investments before 2020 (“Plan Voiture Electrique”). Investments in actual projects, research budgets, legislations

				<ul style="list-style-type: none"> and regulations Focus on stimulating the battery industry Government investments in knowledge development with a sum of € 60 million before 2012 Tax scheme– purchasing premium € 5,000 for new electric transport
United Kingdom	By 2020, every new car must be electric or hybrid and have less than 100gr CO ₂ /km in emissions	unknown	<ul style="list-style-type: none"> Participant in Green E-motion EU demonstration project participant in ENEVATE project 	<ul style="list-style-type: none"> 400 million pounds for “green cars” in 2008-2012, of which: 30 million pounds for charging network 10 million pounds for test beds in 2009 en 2010 120 million pounds for R&D (loans to market players) Tax: purchasing grants of 5,000 pounds per car (“electric vehicle consumer incentive”)
Germany	1 million in 2020	unknown	<ul style="list-style-type: none"> 8 model regions for electric mobility as test bed International test bed NordRhein Westfalen with the Netherlands Collaboration with France in “Working group Automobile” 	<ul style="list-style-type: none"> €500 million for R&D PKW-tax relief before 2015 € 115 million for test beds Purchasing grant up to €500 per vehicle
Portugal	180,000 in 2020	mid 2011: 1,300 charging stations and 50 rapid charging points; 2020: 25,000 charging points	<ul style="list-style-type: none"> No important transnational projects are known Renault-Nissan has promised to build a plant for the manufacture of batteries in Portugal. 	<ul style="list-style-type: none"> Emphasis on link to smart grids The government project Mobi-E: the construction of a nationwide network of charging points; in 2011, 1,350 charging points must be operational; Tax: €5,000 purchasing grant for a vehicle, exemption from road tax; € 1,500 subsidy for trading in an old car for an electric vehicle
Spain	1 million in 2014	2010: 500 charging points; 2012: 140,000 charging points	<ul style="list-style-type: none"> The Movele project: 546 public charging points and the aim to introduce 2,000 electric vehicles to Barcelona, Madrid and Seville 	<ul style="list-style-type: none"> €590 million for the next two years Tax: 20% subsidy of the purchase price, max.€ 6,000
Austria	unknown	unknown	<ul style="list-style-type: none"> Austrian Mobile Power National Platform – industrial collaboration to implement the ER in Austria; Magna Steyr – invests in battery development 	<ul style="list-style-type: none"> € 19 million per year Relief from fuel consumption tax of € 300 – 500 when purchasing a clean vehicle Exemption from fuel consumption tax and vehicle tax
China	2011: production of 500,000 electric vehicles per year 2012: 10% of the vehicles consume alternative fuels 2012: global leader	Unknown	Collaboration with the United States “Electric Vehicle Initiative” for standardisation, demonstration projects “technical roadmap”, etc.	<ul style="list-style-type: none"> Government programme for purchase subsidies in 13 cities aiming to have 60,000 “new energy vehicles” on the roads in each city by 2012; this programme is specifically aimed at the vehicles with public roles Government policy to support R&D worth € 1,07 billion
United States	2015: 1 million The leaders are California and Washington. California intends to have 200,000	Unknown	Collaboration with China (see above).	<ul style="list-style-type: none"> Government intends to invest 150 billion dollars in advanced power technology over a decade 400 million dollars for electric

	electric vehicles on the road by 2020			<ul style="list-style-type: none"> vehicle technology • 300 million dollars for purchase of federal fleet • 300 million dollars for “state- and local governments” • 11 million dollars for smart grids • 2 billion dollars for battery development • 400 million dollars for testing the charging infrastructure • 25 billion for the development of “advanced technology vehicles” and related components • Tax: tax benefits of € 7,500 for purchase
South Korea	2015: 10% of the annual car sales: 1 million electric vehicles	Unknown	LG Chem Ltd., the largest chemical plant in South Korea intends to invest 640 million in battery technology and manufacture; In 201, the company aims to have a market share of 20 % in the manufacture of batteries.	<ul style="list-style-type: none"> • until 2014, €253 million in R&D in battery technology and charging infrastructure • €35 million for battery producers for R&D • Probable exemption of purchase and user tax; tax on vehicles on grounds of CO₂ emissions