

2nd World Light Electric Vehicle Summit

Rotterdam, 22nd & 23rd November 2017

PLEVs About to Go Global?

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Abstract

European discussions about product safety requirements for Personal Light Electric Vehicles (PLEVs ≤ 25 km/h) are at an advanced stage. As proposed in the prEN 17128 standard, PLEVs will be subject to requirements that largely correspond to the current approval requirements (although these differ by country). The prEN 17128 standard does, however, impose more requirements than is currently the case. Although the industry may not welcome even more requirements with open arms, the prEN 17128 requirements are expected to replace the current approval requirements. This is mainly because approval requirements for PLEVs were nationally established in a short space of time and tend to be stripped-down versions of moped or E-bike approval requirements. As a result, each country has established its own regulations. And as the number of PLEVs is still small, European Member States do not feel the urgency to harmonise their regulations.

The prEN 17128 requirements are based on an analysis of a variety of PLEVs. In other words, they allow for more specification. Moreover, an ECE product-standard would make harmonisation within Europe possible.

If the prEN 17128 standard is imposed, the impact will be considerable. There will be both advantages and disadvantages. The main advantage could be that the vehicles become subject to the same regulations for road use as bicycles, because of their low speed and weight. This would bring much clarity to issues such as helmet regulation and place on the road. Another advantage is that several new categories of vehicles, such as electric kick scooters, will become subject to this standard. As a third advantage, a European harmonised product standard would lead to a European market. Import and export would be boosted and it would become easier for e.g. American and Asian parties to enter this market. If the prEN 17128 standard were to be imposed *globally*, street environments can change very quickly. PLEVs would become a real alternative to gasoline mopeds and cars, which would be a great gain.

Keywords: European globalisation, safety requirements, prEN 17128, Iwheels, PLEV

1 Introduction

Increasing urbanisation resulting in poor urban air quality, congestion and parking pressure, a greater need for customised products in general, a desire to move away from full-sized cars, and the rise of the sharing economy are opening up opportunities for PLEVs (Personal Light Electric Vehicles).

E-bikes are popular in several European countries and especially in the Netherlands, because consumers do not have to get used to different means of transport. Moreover, E-bikes (with the exception of speed pedelecs) do not have to meet European vehicle requirements, which means it is very easy for manufacturers to get allowance for these vehicles on public roads. It seems, however, that the E-bike market is becoming saturated in some countries. It is time for new developments and markets.

2 The PLEV market

The PLEV market will grow steadily in coming years [1], with PLEV sales exploding in Asian countries. The most important reasons for this are: PLEVs take up less space than cars, they do not directly emit air pollutants, they are highly customisable, they are subject to few regulations [2] and they do not require a driving licence. Furthermore, PLEVs are suitable for both commuting – if foldable –, leisure and professional markets like security and logistics.

The electric bicycle is not widely seen as an alternative to the car or public transport yet. Electric bicycle sales in the Netherlands are currently increasing less rapidly than before [3, 4]. That said, the need to switch to alternative means of transport will continue to grow as roads and cities become increasingly crowded and consumers become increasingly interested in clean alternatives. The PLEV industry's revenue is expected to reach 9 billion dollars by the end of 2017 and almost 24 billion dollars in 2026 [1].

3 Regulations

Europe initially paid little attention to PLEVs because of their low numbers and the low risk associated with them (low speed, light weight). Increasing numbers of PLEVs prompted manufacturers as well as governments to start setting requirements for this category of vehicles. Each country attempted to set a minimum number of requirements to ensure traffic safety without stifling innovation. In several cases, a

highly simplified version of the so-called *Brommerrichtlijn* – the guideline for moped approval requirements – was used as a template for PLEV regulations.

Such national regulations come with three major disadvantages. Firstly, international differences in regulations limit the international market. Secondly, PLEVs are often not comparable to mopeds, as a result of which the requirements often do not match innovative vehicles. Thirdly, the *Brommerrichtlijn* was developed for a homogeneous category of vehicles. PLEVs are not homogeneous at all; in fact, there is such a wide variety within this category of vehicles that most PLEVs are currently not allowed on public roads.

4 prEN 17128 [5]

As mentioned, the lack of regulations is a high sales barrier for the introduction of PLEVs in Europe. Regarding the current regulations, the non-existing seat at most PLEVs causes the exclusion of the market. To handle this, manufactures can basically follow two paths for authorisation. One is the complicated path to find the matching rules in every European country. Some governments have clear rules but added specific requirements like a max speed of 18 km/h like Belgium. Others were willing to setup or change the rules, like the Netherlands and finally also Germany. Yet, most countries only offer a vague reference to E-bikes without a clear and official 'yes' to PLEVs.

The other path to authorisation is via Brussels. This is what Segway, Trikke and others have done: the lobby for an official exclusion of the EU-type approval. After three years the European Commission decided to exclude PLEVs for European Type approval. This was 'the go' for a procedure via the CEN, to set up a EU wide product safety standard for PLEVs.

In summer 2013, the CEN setup a Workgroup under the Technical Committee for road vehicles. As representative of the Netherlands, Trikke Europe joined the Workgroup with other European manufactures like Honda, Decathlon, Micro-scooter, Toyota and Segway.

The new standard prEN 17128 is setup in three steps: the potential hazards, the product safety requirements and the test methods. Based on this, every certified test lab will be able to test and approve accordingly.

The variety of the PLEVs - with self balancing vehicles, 2-wheeled electric kick-scooters, and a three-wheeler like the Trikke EV – makes it difficult to cover all the aspects like braking, power control, steering, balancing and Electromagnetic compatibility.

For the CEN Workgroup it took more than four years to create a publishable document. Finally last July, the Draft Standard was ready for publication so for gathering amendments from the market. Early this November month, the CEN Workgroup started reviewing the amendments.

Working on the amendments brings big surprises now and then, like the wish for a special light signal for vehicles to ride max. 6 km/h on pedestrian areas. Also the question where to adjust the bell in case there is no handlebar, can be a head-breaking issue. Another open matter evolves around the question whether or not the requirements in the Standard may interfere with ‘the urban mobility facilities of the future’ like unmanned rental as public sharing.

In coming months a new draft will be prepared. Then the procedure for approval of the new EU Standard for PLEVs will take place, probably by the end of 2018.

5 The future

If the prEN 17128 standard were to be imposed, the impact will be considerable. There would be several advantages. The main advantage could be that the vehicles become subject to the same regulations for the use in traffic as bicycles, because of their low speed and lightweight. This would bring much clarity to issues such as helmet regulation and ‘place on the road’. Another advantage is that several new categories of vehicles, such as electric kick scooters, will become subject to this standard. As a third advantage, a European harmonised product standard would lead to a European market. Imports and exports would be boosted and it would become easier for e.g. American and Asian parties to enter this market. If the prEN 17128 standard were to be imposed *globally*, street environments could change very quickly. PLEVs would become a real alternative to gasoline mopeds and cars, which would be a great gain.

It is expected that the market will grow substantially, while an increased number of regulations will improve product safety worldwide. If the diversity of the products can be maintained – if regulations do not limit design

too much – this development could benefit various target groups. Commuters would be able to bring foldable PLEVs for the last mile on public transport or in their own cars (when parking outside city centres, for example). Young people would be able to use PLEVs for fun and older people would be able to use them for convenience. PLEVs designed specifically for the latter target group are expected to become popular because of the ageing population.

6 Other trends

6.1 Campus-type environments

PLEVs are increasingly being used in campus-type environments, e.g. universities, hospitals, retirement communities, military bases, airports and manufacturing facilities. This trend of increasing PLEV use in campus-type environments has been going on for a while, because vehicles that have not been approved can be used on company premises. Another reason why more and more companies are opting for PLEVs is that they can be used inside buildings, as they do not have an exhaust.

6.2 Sharing economy

The sharing economy is very much on the rise. The internet is merging with the physical world. In addition to sharing information and experiences, we more and more share material resources such as cars, garden tools, and even capital. Because of this behavioural change, we are finding different ways to satisfy our needs: cars without rental companies, tools without hardware stores, and loans without banks.

PWC [6] has thoroughly studied sharing economies. Their research shows that:

**The sharing economy is still growing, from 10 billion euros in transactions in 2010 to 28 billion euros in 2015.

** The sharing economy is becoming the default choice of young people, which indicates the growing importance in the future.

** Domestic services are the collaborative services that are showing the highest rate of growth, but the sharing economy for transport will have the most significant effect on our lives. Services with the greatest potential for growth are carpooling and car sharing in combination with PLEVs for the last mile.

6.3 Place on the road

Much research on the changing use of vehicle lanes shows that pavements, bike lanes and car lanes in cities no longer meet current needs. Cars will be increasingly banned from city centres in the next few years, creating more lane space. Especially in the Netherlands, bike lanes in cities are becoming too narrow for the increasing number of bicycles, scooters, mobility scooters and cargo bicycles. Several cities are investigating whether bike lane use could be optimised by banning mopeds (>25 km/h) from bike lanes.

7 Individual responsibility

The harmonisation of regulations will help to improve PLEV safety. This, however, does not absolve manufacturers and users from their individual responsibility to think critically about traffic safety. For example, cargo E-bike innovation and the increasing volume and weight introduce new safety risks. PLEVs with different steering or braking mechanisms or ‘self balancing’ mechanisms may also create new risks. PLEV innovation must always go hand in hand with critical thinking about traffic safety.

References

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Authors



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Jacoba van Gastel previously worked at the Delft University of Technology, serving as director of European subsidy programme Leonardo da Vinci, which aims to bring innovations to small and medium-sized enterprises more quickly. After that, she became managing director at the Dutch Vehicle Authority (RDW), where she was responsible for testing and Whole Vehicle Type Approval worldwide. In 2016, she launched Iwheels platform <http://we-all-wheel.com>.



Pieter Dekker

Pieter Dekker founded Trikke Europe in 2003, fully licensed by Trikke Tech Inc (USA) as manufacturer and exclusive European distributor. As pioneer in the market, Pieter is closely involved in the (inter)national positioning, legislation and safety standards of PLEVs: board member of the Dutch Organisation for Electric Transport (DOET), member of the Light Electric Vehicle Association (LEVA), member of the Dutch Standardization Institute (NEN) and, on behalf of The Netherlands, member of the PLEV Working Group of the European Committee for Standardization (TC354 WG4). <http://trikke.eu>, <http://doetdoet.nl>