

eSafetySupport small study on:

Creating an Intelligent Car and Road Lead Market in Europe

The ERTRAC Technology Platform identified the Intelligent Cars and Roads as a potential Lead Market. The eSafety Forum has expressed its willingness to support the appropriate initiatives to stimulate the take up of emerging technologies and innovative business models.

Background

The Union's return on its private and public investment in research and innovation can be increased through new products and services revealing more quickly demand, if these emerging markets are identified at an early stage and if favourable market conditions are established by concerted action of public authorities. Public authorities can indeed enhance the quick take-up of innovations thus giving industry the opportunity to turn these innovations into world-wide leading products or services in new high-growth markets ("lead markets") on the basis of the Union's industrial dynamics.

The Council endorsed the Commission's proposal to launch a lead market initiative in 2007 to develop an appropriate approach in a limited number of potential lead markets. An agreement was reached on key features of such markets and of the initiative:

- The initiative is about developing a prospective, concerted and focused approach of regulatory and other policy instruments to allow a varied set of technologies and of innovative business models to meet rapidly the demand and to benefit from a mobilising effect generated by this initiative.
- The assessment of the market potential and of the demand side (including of users' needs) is therefore a crucial point;
- The aim is not "to pick winners", nor to artificially create a market for a given technology or pre-empt the development of other competing options;

The selection of the candidate lead markets is to be done within the spectrum of the areas indicated by the Council endorsing the Commission's Communication and building on consultations undertaken with important European stakeholder groupings, such as the European Technology Platforms (ETPs), the Europe INNOVA Innovation Panels and the i2010 groups.

The **Lead Market** concept (Beise, 2001) suggests that for many innovations lead markets exist that initiate the international diffusion of a specific design of an innovation. Once a specific innovation design has been adopted by users in the lead market subsequent adoption by users in other countries is more likely. One can define lead markets as regional markets with specific attributes that increase the probability that a locally-preferred innovation design becomes internationally successful as well (Beise and Cleff, 2003). In addition, based on first mover advantages, producers supplying these markets early on will have permanent advantages when the technology spills over to other countries. Several European countries show the characteristics of a lead market concerning the automobile branch. Porter (1990) describes the demand conditions in Germany as one of the factors explaining the success in export of German firms. French companies seem to have an advantage in designing cars as well due to the responsiveness of their local customers.

According to Beise and Cleff the lead market for automobiles in Germany is characterised by a combination of several factors:

- The high natural tendency to consume the automobile leads to a comparatively high valuation of this good which goes together with a willingness to search, examine and select new products; this fosters the perception of product innovations by the consumer;
- High fuel prices have stimulated the diffusion of new engines with high fuel efficiency early on; this may result in a price advantage due the manufacturing experience of large lot sizes for corresponding product innovations;
- The German automotive industry also benefits from a transfer advantage, which is maintained through the strong presence of its firms abroad and the established image of the German automotive industry as high-quality suppliers; the transfer advantage reduces possible hesitations of foreign consumers concerning a new innovation, hence leading to an export advantage;
- The German automobile market is open and overall intensely competitive especially between local manufacturers. In addition, the size of the German automotive industry leads to industry structure advantages through a dense network of highly specialised and technologically competent component supplier firms from all industrial sectors. Those are – opposed to the industry-structures in the US and Japan – not bound to certain manufacturers but deliver mostly to several manufacturers; therefore, innovations in the area of parts and components diffuse especially rapidly between the companies and foster competition further;
- Finally, the lead market role is also strengthened by infrastructure and legal framework (dense motorway network, no speed limits, taxation, etc.) and this reinforces customers' demand for driving qualities at high speed and safety features.

ABS offers an example of the importance of the market in the case of complex products.

Lead markets do have an impact on the value chain. Companies of a lead market convert the specific demand to a demand of components and intermediary products, thus passing lead market impulses upstream along the value chain. On the other hand, **idiosyncratic product innovation**, which is adopted locally but does not spread to other countries, limits the competitiveness of firms acting within this country. A firm responding to idiosyncratic markets can achieve a temporary local innovation success but is later pushed to switch to the dominant design.

A consideration of the lead market aspect in the national innovation policies generally means the following:

- (1) To support the competition between innovation designs; the high competition between the European automotive manufacturers and between suppliers is particularly characteristic for the European market; For example, the different power train technologies (petrol-operated engine, diesel engine, liquid gas engines, electric motor, fuel cell) represent different innovation designs;
- (2) To be amenable to the diffusion of new technologies from other countries/regions and an early adopter, or adapter, of new technological trends; the case of ABS brakes is a good example. Diffusion is further facilitated when manufacturers and suppliers are global players, which is particularly true for the European suppliers and automotive industry;
- (3) To operate an open markets policy, especially by supporting the diffusion of international standards.

Customers have a high interest in those aspects, even if their willingness to pay for particular features remains uncertain. Due to high fuel costs, the main thrust of innovation on the

Japanese market will be in the field of power train technologies. Innovations in driving assistance systems are also expected in Japan and Europe. In North America many innovations are expected to be introduced with a lag of three to five years due to the legislation of product liability and cost pressure. In addition, the organisation of the value chain and the limited role of suppliers in innovation may hinder further an early introduction by US firms.

The interest of society to protect the environment and reduce accidents, shared throughout the world, became a major driver for innovations. Key issues are here the reduction of gaseous emissions, safety, material recycling and noise. Since the overall trend in the last 30 years is towards cleaner, safer, quieter and waste-free vehicles, manufactures which invested early into appropriate technologies have an advantage. Many of the innovations shown are driven by environmental concerns, e.g. power train improvements and light weight materials.

Comparing the customer requirements for commercial vehicles with those for passenger cars, there seem to be differences that one may assume would result in differences in innovation priorities, too. For a buyer of a passenger car the cost of purchase is most important, while a buyer of commercial vehicles aims at minimising the 'total cost of ownership'. Innovations for minimising repair time through self and remote diagnostics and for lowering insurance rates through higher driving safety (e.g. electronic driving assistance like night view display) do not vary from the needs of a passenger car customer (McKinsey&Company, 2003).

For both passenger cars and commercial vehicles, customer requirements go in some instances in the same direction as regulation; for instance, lighter car body materials can reduce the costs of utilisation but also contribute to lower emissions This applies also to environmental concerns and it can be expected that it will, in the medium term, lead to innovations in fuel-injection technology and in emissions-after-treatment systems which will affect both sectors.

Objectives

Lead-markets are regional markets (most often countries), which utilize a certain innovation design earlier than other countries and which do have specific properties (lead market factors) which increase the probability that other countries will adopt to the same innovation design, too. Lead markets are characterised by high per-capita income, demanding and innovative consumers, high quality standards, and flexible, innovation-friendly framework conditions for producers and users.

The creation of an innovation-friendly European lead market in the area of Transport and more specifically on Intelligent Cars and Roads will contribute to increase the competitiveness of the European industry.

It is important to identify the necessary research agenda and address the deployment barriers for innovative products and services in this field.

The research agenda focus on cooperative systems based on vehicle to vehicle and vehicle to infrastructure communications and large-scale pan European demonstrations to validate and test the results of research.

The deployment barriers are insufficient public sector investment in innovative products and services, lack of European common specifications of Systems and Services as well as issues related to privacy of personal data and liability.

In order to promote such a lead market, the purpose of this study is to identify and detail additional initiatives needed and identify deployment barriers as well as the necessary public policy measures, supported by statistical data and market indicators.

Required actions:

- identify the specific properties (lead market factors) which increase the possibility for countries to adopt the innovation;
- identify and analyse the determinants of lead-markets for both environmental friendly as well as economically and socially sustainable products and processes related to Intelligent Cars and Roads;
- identify the framework conditions which support the constitution of global lead markets in this field;
- analyse the national prerequisites as well as the global effects of diffusion.

References:

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