

## HTAS

### The technology and the applications

#### Driving guidance

Driving guidance allows three combined goals to be achieved:

- more convenience for the car driver;
- better traffic flows; less congestion;
- improved road safety.

The basis for this technology is electronics and sensors. These can measure and control the position and movement of vehicles in combination with communication from vehicle to vehicle, and between vehicles and the traffic control center. Technology development is a step-by-step process, and will eventually result in integrated systems, in which on-board computers will take over a significant part of the driver's tasks.

#### Vehicle efficiency

The use of fossil fuels and increasing CO<sub>2</sub> emissions are major concerns. The improvement process allows reductions of more than 20% to be achieved by:

- optimization of the injection and combustion process in the engine: higher temperatures and more complete combustion;
- further reductions in the weight of the vehicle and in friction, together with increased comfort; lightweight structures and materials for these purposes;
- electrification of vehicles;
- integrated energy management in the vehicle with energy recuperation and optimal control and navigation.

The individual technologies for these purposes are being developed in the HTAS program. The focal point is the target of 20% energy reduction in the diesel powered heavy trucks segment (DAF). The truck will almost certainly be the most widely used vehicle for heavy transport tasks in the coming 20 years.

### The program and the participants

The High Tech Automotive Systems innovation program had around 50 participants in 2008, with a total of 38 projects and an investment value totaling 123 million euro. Around 37% of this sum is government subsidy.

The basic principles of the joint automotive program are:

- the choice of 'driving guidance and vehicle efficiency' as primary focus for growth and innovation;
- an 'enabler' program aimed at education, knowledge transfer and business development to accelerate innovation and support the growth opportunities of SMEs;
- the shared target of increasing the revenues of the Dutch automotive industry from 12 to 20 billion euro, and employment by 10,000 jobs, in 2015.

Driving guidance and vehicle efficiency are not only the drivers for growth. They are also the key factors that will lead to significant improvements in the sustainability, safety and reliability of automotive transport in the coming decade.

The Dutch automotive sector consists of more than 200 companies with specific competences in materials, mechatronics, embedded systems and heavy transport vehicles. Research and development are carried out at TNO, 3TU and a number of universities of applied sciences into areas such as integrated safety, vehicle dynamics, powertrains and mobility. The competences in the proposed program are held partly by the large companies in this field such as DAF, TomTom, Navteq, NXP and VDL.

## Point-One

### The technology and the applications

Point-One focuses on the technology domains of nanoelectronics, embedded systems and mechatronics. The applications are divided among five socially relevant business cases:

#### Healthcare and wellbeing: improving quality and costs

Effective solutions for the prevention, diagnosis and treatment of diseases in the hospital, at the doctor's surgery and at home. E.g. image-guided interventions using micro-instruments, and intelligent devices for home care.

#### Energy and power: savings of up to 40%

Clean and affordable methods for the generation, storage and use of electricity at home and in companies. E.g. solar cells, LED lighting, smart grids and batteries.

#### ICT equipment and components: 100% export growth

The worldwide growth in ICT is enabled by the exponentially increasing capacity of data processing systems (Moore's Law). The Point-One companies supply essential components. E.g. nanotechnology for mass production of ICs, industrial printing and circuit design.

#### Lifestyle and leisure: maintaining market share

User-friendly electronic consumer products for people in all phases of their lives. E.g. intuitive operation, direct connections to everything, everywhere, and domotics.

#### Transport, logistics and security: efficient use of infrastructure

Reliable and safe solutions for the transport of people and goods by road and by air. E.g. direct interaction between vehicle and road, and tracking and tracing of products.

### The program and the participants

More than 110 R&D projects started in the Point-One innovation program between 2006 and 2009, with over 120 participating companies and knowledge institutes. These projects represent an investment of 730 million euro, of which 275 million euro by the government.

Work is being done under the title 'From Good to Great in Dutch Technologies' on technologies to solve societal problems in projects that are economically attractive and that contribute to the growth of the sector. More than 70% of the project portfolio forms part of European innovation platforms (Eureka clusters and Joint Technology Initiatives).

Point-One is also working on strengthening the value chain in the technology 'ecosystem'. These projects focus on the competitive strength of SMEs and the availability of human capital. The emphasis is on joint innovation in the supply chain and access to international markets, together with targeted education and recruitment of the technical talent that is essential for the sector.

The core of Point-One is made up of large multi-nationals that together spend billions each year on R&D, and have global leadership positions in their respective markets. Important players are Philips, ASML, NXP, Océ, FEI, Vanderlande, Thales and ASMI. In the same regions, these companies are surrounded by hundreds of SMEs and knowledge institutes working on their own and joint innovation projects.

## M2i

### The technology and the applications

Materials play important roles in all our lives. Material quality is important for a wide range of functions: a shaver that is comfortable to use, lightweight and economical vehicles, protective clothing or a reliable computer.

The Dutch HTSM companies have a great need for material innovations because these form the basis for strong competitive advantage. And society needs new materials to improve sustainability and combat material shortages.

The HTSM companies jointly support and use the research of M2i. This comprises a wide range of material types such as metals, polymers, composites, laminates, hybrid materials, ceramics, textiles and glass. An increasing amount of research work is into combining and integrating materials to create unique properties. This integration research takes place at all scales: nano, micro, meso and macro.

Detailed business cases have been developed for eight industry sectors: aircraft building, automotive, maritime, energy systems, material production, medical systems, civil industries and professional & consumer products. Despite the big differences in applications, there are many common research themes. Important themes are: (1) multiscale basic knowledge of structural and functional materials; (2) process technology for functional materials; (3) sustainability; (4) surface technology, interfaces and thin films; (5) high-strength lightweight materials; (6) specific high-strength steels; (7) high-tech bonding technology; (8) modeling and testing.

### The program and the participants

The 'Materials to innovate industry and society' innovation program had more than 40 participants in 2009, with a total of 130 projects and investments of 23 million euro. Around 37% of this sum is government subsidy.

The basic principles for the materials program are:

- the great influence of materials technology on economic growth and sustainability;
- the clustering of material research by the industry sectors into a single program with sufficient focus and critical mass;
- bringing together the players in the value chain to accelerate innovation;
- combining knowledge and expertise in one program that can then become a European center of excellence in material technology.

The materials program extends from fundamental research through applied research to knowledge transfer and valorization. The fundamental research focuses on breakthroughs that can really make the difference. As well as that there are valorization modules aimed at converting the knowledge that has been gained into profitable businesses, which are particularly important for SMEs and start-ups. The program also has a strong human capital component.

Thanks to the permanent participation of multi-nationals such as ASML, Philips, DAF, Corus, SKF, Stork and FEI, M2i has the assurance of working on the latest developments. That forms the basis for the high value of exports by these companies. The other cornerstone of M2i is the permanent participation of top international universities such as those of Aachen, Leuven, Cambridge and Oxford, and of the Dutch universities in the 3TU alliance, as well as Groningen, Utrecht and Nijmegen.

