

SAFE AND GREEN ROAD VEHICLES IN EUROPE





PARTNERING FOR ROAD SAFETY, REDUCED EMISSIONS AND GROWTH IN EUROPE

The SAGE partnership consists of five regional research driven automotive clusters. We have joined forces in order to address common challenges and to use the unique strengths of our respective regions in collaborative research and innovation. Our cooperation platform is built on the triple helix concept, because if both societal and technical change is required, both public and private actors need to be engaged more deeply. We are convinced that innovation strategies need to be built around systemic approaches and strategic cooperation. The SAGE project contributes to that ambition by engaging in cross-cutting exchanges between technical and social domains, and between countries both inside and outside Europe, in order to establish new products, new services, and new business models.

Radical change is needed if we are to meet international targets for decreased emissions and reductions in the numbers of deaths and serious injuries in traffic. The

automotive industry is a major economic driver within the EU and the potential growth in jobs and GDP from obtaining a lead in clean, smart, and safe vehicle technology development is significant.

SAGE is financed by the European Union 7th Framework Programme within Regions of Knowledge – an initiative created to strengthen regional capacity in research and innovation.

With this magazine we would like to welcome you to the world of SAGE. We hope that you find our stories interesting and we invite you to join us in collaborative research and innovation.

Hanna Blomdahl
Coordinator SAGE
Region Västra Götaland, Sweden



SAGE Coordinator Hanna Blomdahl. The aim of SAGE is to strengthen regional capacity in research and innovation and thereby support the transformation of road vehicle technology and its market.

SAGE ACHIEVEMENTS SO FAR

- Cluster mapping and analysis of the respective regions
- Transnational sharing of best practice on cluster management
- Benchmark report and cooperation strategy for automotive clusters in Asia
- Mentoring plan for emerging regional clusters in Europe
- Joint action plan for future R&I collaboration
- Involvement of regional stakeholders in transnational research projects



The clustering of clusters is promoted by the European Union. It is an excellent opportunity to enhance regional capability with transnational best practice and to give members of the clusters access to new partners for collaborative research and innovation.



COLLABORATION AS A DRIVER FOR INNOVATION

The Västra Götaland transport cluster draws its strength from a long tradition of collaboration between academia and the public and private sectors.

An early understanding of the value of cooperation and open innovation is the reason why Västra Götaland is today a leading force in several fields of research and innovation. For many years, the region has been characterized by openness to the surrounding world. It has been named the best logistics location in Sweden for ten straight years and the region's five key clusters (Urban Future, Marine Environment, Green Chemistry, Life Science, and Transport Solutions) are built upon solid cooperation between industry, academia and the public sector but also between companies. This has contributed to the development of the automotive sector and its innovations within the areas of safe and green vehicles, transport, and mobility solutions.

AUTOMOTIVE LEADER

The largest automotive region in Sweden, Västra Götaland employs 42,000 people within the sector. The region is home to AB Volvo, Volvo Cars and other successful companies such as Autoliv, a cluster of IT and telematics companies as well as small and medium enterprises within the sectors of transport efficiency, renewable fuels, and electromobility. Prominent research and teaching is carried out at the Chalmers University of Technology, with 14,000 students and teachers, and centers of excellence in safety, renewable fuels, combustion engines, and electric hybrid technology research. Important hubs for automotive research and innovation are the open arenas at Lindholmen Science Park and Innovatum Technology Park.

HISTORICAL INSIGHT INTO SAFETY COOPERATION

The strong safety research infrastructure in Västra Götaland

has a long history and industry-industry and industry-academia cooperation is well established. As early as 1956 Volvo (now AB Volvo and Volvo Cars) and Autoliv worked together to pioneer seat belt technology. Safety has always been a core value for Volvo, and the company has historically been one of the first on the market in terms of innovation and implementation in the safety field, often in cooperation with Autoliv. Volvo Cars is one of few car manufacturers with its own accident research team, which has a unique track record in having studied 40,000 accidents since it was established.

SAFER JOINT RESEARCH UNIT

SAFER Vehicle and Traffic Safety Centre, hosted by Chalmers and located at Lindholmen Science Park, is a joint research unit where 25 partners from the Swedish automotive industry, academia, and authorities cooperate to create a center of excellence within the field of vehicle and traffic safety. SAFER focuses on a range of research-intensive topics, from pre-competitive research on active safety (pre-crash), passive safety (crash and post-crash) to traffic safety analysis. The center's activities involve the highest elite in the field of traffic safety, and the results contribute to increasing the competitive advantages of the center's partner companies and organizations.

ACTIVE SAFETY TEST AREA, ASTA

The new proving ground for active safety systems, AstaZero, offers a globally unique environment for integrated traffic safety research in Europe, where authorities, academia, and industry can together make significant advances. The testing

facility, which will open in 2014, will give researchers and industry in Sweden and abroad the opportunity to test new solutions for active road safety, safer vehicles, and reduced environmental impacts. It is strategically located at the heart of the Swedish automotive cluster and the assembled expertise that exists within the field of safety. The test area's innovative research environment and proximity to the European network will mean unique opportunities in the future, both for individual researchers and for major projects and collaborations within the field. Future development of AstaZero includes new research fields such as electrification. The company ASTA is owned by Chalmers Technical University and SP Technical Research Institute and is financially supported by Region Västra Götaland, AB Volvo, Volvo Cars, Autoliv, Scania, the City of Borås, Test Site Sweden, Vinnova, and the European Regional Development Fund.

SHARED GOAL TO REDUCE ENVIRONMENTAL EFFECTS

AB Volvo, the world leader when it comes to fuel effective hybrid vehicles, in collaboration with Västra Götaland and Gothenburg City, has a common goal of achieving more effective transportation with lower fuel consumption and reduced environmental effects. This is manifested through joint and live hybrid projects in Västra Götaland.

HYBRID BUS COLLABORATION

The Volvo hybrid bus model consumes almost 40% less fuel than ordinary diesel buses, thereby reducing carbon emissions by the same amount. Volvo hybrid buses running on bio diesel reduce the climate impact still further. The Volvo hybrid bus is equipped with a smaller diesel engine and an electrical

engine. The energy that is re-generated during braking is collected in a battery. At bus stops, the diesel engine is turned off. The bus does not then emit any particulates or gases and runs quietly on electricity. Around 30 hybrid buses are running in Västra Götaland, and they are very much appreciated by the public.

LIVE TESTS AND DEMONSTRATIONS

The Volvo plug-in hybrid bus has a battery with a larger energy capacity and an option that allows for electric grid charging and all-electric driving in certain driving conditions. Plug-in hybrid buses using RME fuel in a diesel-electric power train and rapid charging at end stations are currently being tested and demonstrated in Gothenburg. These buses are expected to use 60% less energy than a conventional diesel bus and achieve more than a 70% reduction in CO2 emissions. Volvo also has all-electric buses in development that are likely to run in the city in the future.

COMMON VISION OF TESTING AND DEMONSTRATION

There is a shared vision in Västra Götaland that investing in testing and demonstration is important. In combination with strong competence and a collaborative approach to technical development, this should influence innovation in a positive way. In the future we are likely to see more examples of projects where vehicles in Västra Götaland are connected to the environment, traffic, infrastructure, people, and the city.

“WE ARE PROUD TO COOPERATE WITH SP TECHNICAL RESEARCH INSTITUTE OF SWEDEN IN BUILDING A UNIQUE TEST FACILITY FOR ADVANCED TRAFFIC AND VEHICLE SAFETY.”

Jörgen Sjöberg, Chief Development Officer,
Chalmers Technical University

IMPORTANT PLATFORMS IN THE COLLABORATIVE AUTOMOTIVE CLUSTER

Lindholmen Science Park

Test Site Sweden

Innovatum Technology Park

SAFER Vehicle and Traffic Safety Centre

Asta Zero Active Safety Test Area

Swedish Hybrid Centre

F3 Swedish Knowledge Centre for Renewable Transportation Fuels

Closer National Arena for Transport Efficiency



Sweden's long traditions of injury prevention research and fruitful collaboration within SAFER have resulted in the development of the first prototype of a female crash test dummy, representing an average woman.



A DYNAMIC ECOSYSTEM OF INNOVATION

With more than 300 innovative members, the leading French automotive cluster Mov'eo enables cooperation and interaction between stakeholders in the automobile and mobility industry.

The Mov'eo research driven automotive cluster was created in June 2006 as part of the "Pôle de compétitivité" policy launched by the French government. Dedicated to the domain of automobile and mobility, Mov'eo today involves 340 members representing the triple helix of legal entities conducting research, businesses entities, and regional and local authorities. The objective is to make private cars and public transport safe for people and their environment.

KEY PLAYER IN COLLABORATION

Forming an extensive and dynamic innovation ecosystem, Mov'eo has become a place where sustainable collaboration between different actors in the automotive industry is built. As a key player in cooperation and interaction facilitation it has reinforced the links between major industries, small and medium enterprises (SMEs), universities, and laboratories and has built a dynamic network to meet the technological challenges of clean and safe mobility.

NUMEROUS PROJECTS

Located in three regions (Paris, Upper Normandy and Lower Normandy) where 70% of French automotive R&D activities are conducted, the cluster develops innovative collaborative projects to reinforce the international competitiveness of French businesses on the continent and abroad. In six years, more than 300 collaborative projects have been initiated by Mov'eo in the areas of green, safe, and connected future mobility in its Strategic Activity Domains.

COOPERATIVE MODE OF OPERATION

Mov'eo contributes to the dynamics of regional attractiveness and industry competitiveness through a cooperative mode of operation, partly by means of industry-oriented projects carried out jointly between large, small, and medium enterprises, research institutions, and training organizations, and partly through territory-focused management and the sharing of infrastructure and modern test facilities.

PROJECT AREAS

The Mov'eo cluster forecasts developments in clean technologies, low CO2 vehicles, safe and connected vehicles, and new mobility solutions. Its collaborative projects focus on seven Strategic Activity Domains: Intelligent Mobility Solutions; Road User Safety; Demonstrators and Carbon-free Vehicles; Vehicle Environmental Footprint; Energy Storage Systems; Mechatronics Systems, and ICE Powertrain.

ELECTRIC MULTI-VEHICLE MOOVILLE

One example of a collaborative research and development project is Mooville, the new urban electric vehicle for multi-applications. The aim of Mooville is to provide new customer services to the urban area and to give an answer to new urban mobility expectations from the parcel delivery industry and urban authorities. Muses, the design, manufacture and sales company of Mooville, currently offers a range of Mooville electrical multi-vehicles for packaged, dry bulk, and refrigerated goods.

VEDECOM INSTITUTE

An example of a collaborative structural and territorial project is the creation of the VeDeCoM Institute, a public-private institute for green and connected vehicles. The VeDeCoM Institute received an accreditation program and €54 million in funding from the French government in March 2012. The institute already boasts 44 members: 10 universities and educational institutions, 5 research and technical bodies, 12 major industrial groups, 14 SMEs, and 3 municipal governments and urban planning establishments. In 3 years the institute will employ 280 scientists, and over the next 10 years will receive €300 million of investment.

The aim of this project is to become the institute for the new sustainable individual mobility sector, with its two applicative sectors: the vehicles themselves, both carbon-free and communicative, and the eco-system for the carbon-free mobility these new vehicles will create.



MOV'EO FACTS

- 350 members among 190 SMEs
- 156 R&D projects currently selected and financed (involving more than 1000 partners, representing an overall budget of €794 m and a total amount of public funding of €332 m)
- More than 1000 partners involved
- Overall budget €722 m
- Public funding €309 m
- Provides services to the Mov'eo members in four cross-cutting action plans:
 - o Mov'eo-SMEs: Offering exclusive services to the SMEs and helping them in their R&D development
 - o Mov'eo-International: Developing international relations, building R&D partnerships and promoting the cluster
 - o Mov'eo-IP: Assisting Mov'eo members in their IP and technology scouting
 - o Mov'eo-Competences: Attracting students and anticipating needs for skills



Mooville Project. Start-up company MUSES.
See more on www.mooville-by-muses.com.



Mov'eo's seven strategic activity domains and three territories.

"THE OBJECTIVE IS TO IMPROVE THE COMPETITIVENESS OF OUR MEMBERS THANKS TO OPEN INNOVATION."



A STRATEGIC NETWORK FOR GREEN MOBILITY

The e-mobility cluster of Regensburg operates in the eastern part of Bavaria. The economical and scientific center of the region is the City of Regensburg, a high-tech location in the fields of automotive, electrical engineering, information technology, and energy.

The Regensburg region has approximately 2.3 million inhabitants and is one of the top 15 technology areas in Germany according to the Prognos report "Regions in future competition". The region is host to several world market leaders with a high level of industrial R&D activities as well as many innovative SMEs and mid-size companies. At least 25,000 jobs are directly connected to the automotive sector. The research and production facilities of the global automotive supplier Continental are situated in Regensburg, with more than 3,400 employees working in R&D.

HIGH DENSITY OF AUTOMOTIVE SUPPLIERS

Compared to many other automotive regions, Regensburg is not centered on one single leading OEM but is characterized by a high density of suppliers, ranging from Tier 1 downwards.

A STRATEGIC CLUSTER IN E-MOBILITY

The Regensburg e-mobility cluster (e-mobility-regensburg.de) has more than 40 active members – global players, mid-size enterprises, SMEs, and universities – who are committed to cooperation in the field of electromobility and green automotive applications. The e-mobility cluster is a distinct supplier network. The activities are centered on three strategic domains along the value-chain of electromobility:

- Electric vehicles
- Intelligent charging infrastructure
- Smart grid

The most important objective of the e-mobility cluster is to facilitate innovative research projects on a regional, European and international basis. Three examples of projects are described below. Regular cluster meetings offer opportunities for networking and exchange of experience in the field of electromobility. Great emphasis is also placed on links to other regional, European, and international clusters. The e-mobility cluster is the associated partner of the showcase "Elektromobilität verbindet" – one of four showcase regions selected by the German government beginning in 2012. The installation of a charging infrastructure in Regensburg and Eastern Bavaria has already begun.

FLEET TEST IN THE MUNICIPALITY OF REGENSBURG

Urban traffic with its short distances is a promising use case for e-vehicles today. In a demonstration project together with Siemens, Sixt and Continental, the City of Regensburg is testing e-vehicles in its car pool. The vehicles are equipped with the data-logging system AutoLinQ for EV from Continental. With this system, vehicles can be easily

controlled via smartphones to provide drivers with access to data for their electric vehicles at all times. The system uses an open platform that offers very flexible options and services. With its permanent mobile communications between the vehicle and the service delivery platform, the system provides excellent connectivity. The acceptance of the HMI interfaces in the electric vehicle is investigated by surveys. The project runs for two years. Objectives of the project are:

- Improved visibility of e-mobility
- Investigation of the usability of e-vehicles including charging infrastructure with a distinct target group of users
- Evaluation of economic efficiency today and in the future for this special use case

NETWORK INTELLIGENT CHARGING INFRASTRUCTURE

In order to accelerate the acceptance of e-vehicles, a recharging infrastructure is required to allow e-cars to travel anywhere in a country without running out of power. It is planned to install nearly eight million charging points in the EU by 2020. Germany is one of the leading countries supporting the installation, which could enable one million e-vehicles to drive on German roads in 2020. The research driven network

"Intelligent Charging Infrastructure" is a subgroup of the e-mobility cluster with 12 members from industry and academia. The objective is to collaborate on innovative research and development projects in the charging infrastructure field. The members are specialists in hardware and software for charging stations, battery technology, smart grids, and ICT. Global players and SMEs collaborate here on challenges such as interoperability between stations, HMI interface and the usability of charging points, integration into the electricity grid, and functional safety. The network is funded by the German Federal Ministry of Economic Affairs.

HIGH-TECH NOVEL POWERTRAIN CONCEPT

Together with Ford, Schaeffler, Continental and RWTH Aachen, the Laboratory for Safe and Secure Systems (LaS³) in the Faculty of Electrical Engineering and Information Technology at the University of Applied Sciences, Regensburg, is developing an e-vehicle with a novel powertrain concept using wheel hub drives with an integrated brake system. Combined with drive-by-wire this enables a torque steering system for the vehicle. The objective is an e-car with the highest space and energy efficiency providing advanced driving safety. The complex functional safety concept for the wheel hub drives will be developed in Regensburg.



E-mobility in action; Continental demonstrates all-round expertise, equipping and connecting an electric vehicle with 40 serial components.

"VIA SAGE, WE EXPAND OUR ALREADY STRONG REGIONAL NETWORK OF KEY ELECTRO-MOBILITY STAKEHOLDERS EVEN FURTHER."

Martin Boeld, Project Manager, E-mobility Solutions, Continental



Wheel hub drive prototype.

Source: Schaeffler



CREATING SYNERGIES FOR IMPROVED VEHICLE ENERGY EFFICIENCY

Piemonte and its capital city Torino, home to the Italian multinational Fiat, is the core of the national automotive industry. Here efforts are made to lower the environmental impact of vehicles.

The automotive district of Piemonte is made up of about 950 companies, 45% of the Italian total, and employs a workforce of over 140,000 people. The automotive district comprises OE components and systems for cars and industrial vehicles producers, acting as leading suppliers for major European and international car makers, as well as firms working with design services, engineering specifications, and styling.

CHALLENGE TO REDUCE FUEL CONSUMPTION

The reduction of fuel consumption and CO2 emissions is the most important challenge for the automotive sector over the next 20 years. Regione Piemonte also sees this challenge as an opportunity for technological and economic growth, which can be exploited only by winning the competition for sustainable technological innovation.

THE NECESSITY OF COLLABORATIVE RESEARCH

Regione Piemonte acknowledges the importance of collaborative research in order to guarantee project quality and competitive advantages when innovative product development projects are packaged into commercial products. The region is therefore eager to create synergies among various types of organizations with solid know-how in different areas.

TELEMATICS DEVELOPMENT PROJECTS

To strengthen cooperation between public and private organizations in the commercialization of near-to-market research, Regione Piemonte has adopted a Technological Platform approach, following the European model. In addition to the existing Technology Platforms, in 2012 Regione Piemonte launched the Automotive Technology Platform with the aim of financing programs, large industrial research projects, and pre-competitive development projects of strategic interest for the region.

In the framework of this initiative an "Automotive Call" has been launched to co-finance six projects developed by consortiums of large enterprises, research centers and a significant numbers of SMEs. The budget for the projects is €30 m and they are grouped under three thematic headings:

- Development of engines with low environmental impact
- New materials for lighter vehicle weight
- Loss reduction and energy recovery

SAGE INVOLVEMENT

The SAGE partners successfully positioned themselves for involvement in the approved "Automotive Call" projects starting in 2013. Centro Ricerche Fiat is involved in three of the projects, whilst Politecnico di Torino is engaged in all of them. In particular, both are participating in two proposals addressing significant improvements in vehicle energy efficiency: the Drapo' and Biomethair projects.

THE DRAPPO' PROJECT (COORDINATED BY CENTRO RICERCHE FIAT)

The target of the project is the development of sustainable technologies and components enabling a related improvement in fuel economy. While also focusing on affordability, project activities will aim to develop a new generation of auxiliary systems, components, and materials. The main technical areas to be assessed include waste thermal energy recovery, auxiliary systems, and control strategies for efficient on-board energy management, rolling and aerodynamic resistance reduction as well as weight reduction by using high performance polymer composite materials for structural applications.

THE BIOMETHAIR PROJECT (COORDINATED BY CENTRO RICERCHE FIAT)

The project is aimed at the development of an integrated solution for urban mobility based on a customized A-segment vehicle equipped with an innovative highly efficient CNG engine. The engine will be complemented by a smart energy recovery system and equipped with an advanced gas storage system enabling a vehicle range equivalent to the gasoline reference vehicle. The activities also include the assessment of a complete fuel production and distribution pathway, starting from the most innovative bio-methane production processes and including new advanced green hydrogen production processes.

Centro Ricerche Fiat will employ its core competences and will focus on areas such as engine cooling system, air conditioning, engine development, aerodynamics, energy recovery, and system control.



TURIN 07:55



The Innovation Gallery at Centro Ricerche Fiat.



A START-UP NETWORK FOR ELECTROMOBILITY

Warsaw is the political, economic, academic, and cultural center of Poland. Most governmental and public institutions are located here and most of the national and international corporations from all sectors have their headquarters in Warsaw.

HOME TO MANY WORLD-CLASS SPECIALISTS

Warsaw has 78 universities and colleges with nearly 300,000 students. Given its numerous research centers, academic institutes and business clusters, the city is consequently home to many world-class specialists in all fields of science and professional practice. In the latest annual report of the European Cities Monitor (ECM), Warsaw occupied first place in the ranking of the lowest labor costs versus quality of service, outpacing Bratislava, Lisbon and Prague. It also took a good third position in the ranking of favorable business conditions provided by the government. On this list Warsaw overtook such cities as Amsterdam, Berlin, and Budapest. Currently, there are approximately 300,000 registered enterprises in Warsaw and the city's unemployment level is as low as 3.8%.

WARSAW UNIVERSITY OF TECHNOLOGY

Warsaw University of Technology (WUT) is the leading and largest university in the technology area in Poland with more than 180 years of history. There are 20 faculties at WUT. Today, the University employs over 2,500 academic staff

(including nearly 570 professors and associate professors) and 900 PhD students who conduct research in major technology and engineering areas and some non-technical disciplines. Currently there are over 32,000 students studying at WUT. WUT has participated in European Research Framework Programmes FP6 and FP7 as well as other projects and programs co-financed by the EU.

WARSAW E-MOBIL CLUSTER

The Warsaw E-Mobil Cluster was established in July 2011 by Warsaw University of Technology and Warsaw City Hall. The cluster is a joint initiative by scientific institutions, local government, agencies, associations, funds, and companies which are dedicated to education, research, implementation, and business in the field of electromobility, mainly located in (but not limited to) the Warsaw area. The cluster is young and small, but it unites major Polish national research resources within green and safe road transportation; WUT, CLAiO, PiMOT, ITS, and KOMEL. The objectives of the Warsaw E-Mobil Cluster are:

- Introducing CNG buses to public transport in Warsaw
- Introducing HEV & EV buses to public transport in Warsaw
- Introducing an EV fleet to public or private transportation
- Developing ultra-light niche EVs for urban transportation
- Developing infrastructure and solutions for a smart grid together with local government and Polish energy companies

WUT DEPARTMENT OF MULTISOURCE PROPULSION SYSTEMS

The WUT Department of Multisource Propulsion Systems in the Faculty of Automotive and Construction Machinery Engineering is involved in several research Electric and Hybrid Electric Vehicles (E & HEV) projects. Among them are modeling of E & HEV key components such as the battery, motor and its controller and engine; designing the necessary special components; designing and optimizing a propulsion

system for E & HEVs by simulation, and control strategy studies for HEVs.

The head of the department as well as initiator and chairman of the E-mobil cluster, Professor Antoni Szumanowski, has been involved in E & HEV research since 1976. He holds more than 30 patents on solutions for propulsion systems in the field and has published seven books (three in English and two translated into Chinese) about alternative energy and E & HEVs. Professor Szumanowski is also the president of the Polish Society for Environmentally-friendly Vehicles, which consists of Polish universities, research institutions, and industry. In the last five years, the society has successfully organized several international seminars on Electric Vehicles (EVs) in Warsaw. Uniting academia, industry, and Polish policy-makers, the seminars have aimed to find solutions to speed up the application of electromobility.



Prototype ultra-light niche EV for urban transportation, created by Professor Szumanowski and his team in 2006.

“THE WARSAW E-MOBIL CLUSTER IS SMALL AND YOUNG, BUT EAGER TO LEARN AND OPEN TO COOPERATE. VIA THE SAGE PROJECT, WE CAN GROW BY LEARNING FROM BEST PRACTICES AND EXPERIENCE.”

CENTRALNE LABORATORIUM AKUMULATORÓW I OGNIW (CLAiO)

CLAiO is a state-owned research and development center with many years of experience in the field of chemical power sources (founded in 1947). <http://www.claio.poznan.pl/index.php?lang=en>

INSTYTUT TRANSPORTU SAMOCHODOWEGO (ITS)

ITS is a scientific research institute which deals with the organization, functioning, and effectiveness of road transport, including road safety. <http://www.its.waw.pl/About ITS,1492,1492,2.html>

PRZEMYSŁOWY INSTYTUT MOTORYZACJI (PiMOT)

PiMOT was founded by the Polish Council of Ministers as an automotive industry institute in August 1972. The domains of operation include scientific research and development work dedicated to resolving automotive industry problems. <http://en.pimot.org.pl/>

AMZ KUTNO SP. Z O.O

AMZ-KUTNO Ltd. is a leading Polish company established in 1999, specialized in the design and manufacturing of special purpose vehicle conversions. <http://www.amz.pl/en>



Academic staff from Warsaw University of Technology.

INTERNATIONAL OUTLOOK – ASIA

The objectives of SAGE’s international mission are to identify and benchmark selected research driven automotive clusters in different regions in Asia and to suggest strategies for cooperation.

In today’s world, both cutting-edge technology production and knowledge production are traded globally. The SAGE partnership is convinced that research driven automotive clusters around the world must join forces in order to have a substantial impact on the global environmental and safety challenges. The partnership is equally convinced that only clusters open to input from the surrounding world will be able to stay competitive. With this as a background, SAGE invites clusters from inside and outside Europe to join the network, share best practice, and collaborate within the areas of green, safe, and connected transport and mobility solutions.

SAGE’s international work package has conducted a benchmarking study that describes the existing research and innovation landscape in the Asian regions of Beijing, Shanghai, Nagoya, and Daejeon. The description includes the primary actors and organizations within the areas of green and safe technologies as well as the industrial and policy context. These four regions were chosen because of their extended competence within the SAGE focus areas of Green, Safe and Connected transportation, but also because of their existing cluster organization and supportive policies indicating a growing interest in collaboration.

In order to learn more about the four regions, representatives from the SAGE consortium undertake trips to visit important stakeholders and to establish contacts with stakeholders from universities, industry, and public authorities. The overall aim is to better understand the ecosystem of automotive research and innovation, and to validate the possibilities for cooperation between the SAGE regions in Europe and identified clusters in Asia.

BEIJING

Beijing is China’s political, cultural, and educational center, and home to the headquarters of most of China’s largest state-owned companies, national research institutions, and professional organizations. Beijing has a great number of colleges and universities, including Peking University and Tsinghua University (two of China’s National Key Universities). The city has a very efficient official organization for enforcing New Energy Vehicle (NEV) development and has more than 10 years of NEV demonstration experience. There is a strong supportive policy and rich project funds for guiding durable cooperation and partnership among universities, research institutions, and industry.

SHANGHAI

Shanghai is the largest city and the financial center of China. The regional government strongly supports research and development, and Shanghai is acknowledged as a region with a good investment climate and strong financial power. The city hosts a number of industries with great technical skills, for example within the sectors of electronics and information technology, automobile manufacturing, petrochemicals, steel, and biopharmaceutical products. A number of important universities are present in the Shanghai area and the NEV engineering center in Tongji university is the base of NEV training and innovation in China.

NAGOYA

Greater Nagoya has a very strong economic base and accounts for approximately 1% of overall GDP and about 10% of gross regional product in Japan. The region is home to a number of large automotive companies, boosting research and innovation in the area. The Greater Nagoya region has good research infrastructure both within academia and at industry level, and GreMo (the Green Mobility Collaborative Research Centre) is one example of cluster collaboration now being applied. GreMo is supported by local and national authorities, university and industry and unites inter-disciplinary researchers from Nagoya University within, for example, materials, ITS, and Human Factors.

DAEJEON

Daejeon is now considered to be the science and technology capital of South Korea, and several important public institutions, research institutes, universities, and high-tech companies are based in the region. It is a very dynamic area with a strong focus on R&D and business. Offering an excellent science and technology infrastructure and research manpower, Daejeon is known as the Silicon Valley of Korea with excellent competences in connectivity (infotainment, HMI, communication, ITS etc.) and energy efficiency. The “Innopolis Daedeok” science park and KAIST University (Korea Advanced Institute of Science and Technology) are located in Daejeon.

AN INVITATION FOR TRANSNATIONAL COOPERATION

SAGE is a transnational collaboration platform that builds on the unique competences of participating regions. What differentiates SAGE from other platforms is its full triple helix representation and systemic approach.

The platform also allows direct access to a number of the most important stakeholders within the area of green and safe road vehicle technology. SAGE aims to complement other initiatives that push the sustainable transport agenda.

In order to achieve a substantial impact, SAGE invites clusters from inside and outside the EU to join the SAGE network and to engage in transnational research and innovation together.

THE SAGE JOINT ACTION PLAN

The SAGE joint action plan identifies concrete activities within four focus areas, which are described in brief below. Where does your competence and interest match SAGE?

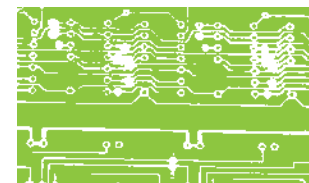
Benefits to SAGE associated partners include opportunities to participate in SAGE events, opportunities for joint projects within R&I and education, access to a wide network of

automotive clusters, visibility and promotion, access to expertise within cluster management, and mentoring support if needed.



SAFE

Safety of vulnerable road users, safety of new vehicles, advanced driver support, traffic safety analysis, safe infrastructure.



CONNECTED

Cooperative ITS, automated driving and platooning, connectivity for electric vehicles, HMI, inter-vehicular network technologies.



GREEN

Powertrain technologies, energy technologies, green production, robustness and reliability, environmental impact of new vehicle technologies.



NEW BUSINESS MODELS AND MOBILITY SOLUTIONS

Vehicle system integration and new architectures, individual and societal demand on sustainable transport and mobility solutions, new mobility solutions and value-added services, economic and social impact.

CONTACT



Paris/Normandy, France
Contact: Marc Charlet, marc.charlet@pole-moveo.org



Regensburg, Germany
Contact: Christine Knorr, knorr.christine@regensburg.de



Västra Götaland, Sweden
Contact: Hanna Blomdahl (SAGE Coordinator)
hanna.blomdahl@vgregion.se



Warsaw, Poland
Contact: Yuhua Chang, yuhua.chang@simr.pw.edu.pl



Piemonte, Italy
Contact: Ezio Spessa, ezio.spessa@polito.it

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www.sage-project.eu