All corridors lead to Gothenburg: Editorial

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Project "**SuperGreen**" is a Coordination and Support Action, co-funded by the European Commission in the context of the 7th Framework Programme. The project involves 22 partners from 13 European countries and was launched in January of 2010.

SuperGreen aims at assisting the Commission with defining the 'Green Corridor' concept and promotes the development of European freight logistics in an environmentally friendly manner. The objectives of the SuperGreen project concern supporting the development of sustainable transport networks by fulfilling requirements covering environmental, technical, economic, social and spatial planning aspects. More details of the project, including all deliverables accepted thus far are available at www.supergreenproject.eu .

Time flies and the SuperGreen project is coming to an end in January 2013. After two plenary workshops (Helsinki 2010 and Genoa 2011), four regional workshops (Naples 2010, Antwerp, Malmoe and Sines 2011), a special session on green corridors at the TRA 2012 conference (Athens 2012), close to 30 other external presentations, and three years full of exciting work, the project is ready to present all its major results in its 3rd and final plenary workshop. **This will take place in Gothenburg, Sweden on 11th January 2013 and will be kindly hosted by SuperGreen partner DB Schenker.**

Agenda

SuperGreen Final Workshop in 2013

The SUPERGREEN final workshop will take place in Gothenburg, Sweden on 11th January 2013. It will be hosted by SuperGreen partner DB Schenker. Details of progress and all major results achieved in the project, including benchmarking methodology, Key Performance Indicators, Green Technologies and ICT systems will be presented at the workshop. Directions of further research as well as policy recommendations will also be discussed. The workshop will also include talks by invited external speakers, all experts in this area. **Note: To attend this event you need to register. You can do so online by visiting the SuperGreen web site** at www.supergreenproject.eu .

Benchmarking Green Corridors

Benchmarking Green Corridors involved a set of tasks aiming at evaluating, selecting and developing of the green corridor concept. Nine corridors were selected for studying and a set of KPIs was defined, the effects of changes in operational and regulatory framework were estimated and the benchmarking exercise in six corridors was performed on the basis of the six most important KPIs: CO_2, SOx, Relative Transport Costs, Transport Time, Frequency and Reliability. Six workshops have been arranged for stakeholder consultation and evaluation of the results.

Major bottlenecks in greening each one of the SuperGreen corridors were defined. Based on this and in combination with the work done in the project, common development areas for all corridors were defined. Development areas were identified in the following groups: Operations; Policies, regulations and legislation; Infrastructure; and ICT & technology. The major development areas concern new ICT systems, improvement of railway operations (infrastructure, operational, ICT), harmonization of national regulations, improvement of customs procedures, hinterland connections, and adequate capacity in all transport networks and transfer points. Improvements towards sustainability are needed in each one of the corridors for different purposes.

Several good practices to improve sustainability were also identified in all corridors and in all transport modes. The problem that arose was the lack of harmonization and co-operation. These are vital elements that are needed to be addressed in order to make use of the good practices more widely.

Based on the identified common development areas and best practices the most favorable areas for improving sustainability are: Improvement of green supply chain design and management, harmonization and development of policies and regulations, development and harmonization of transport infrastructure and transport technology, harmonization and development of ICT solutions and transport documents, improvement of transparency of information and increase of co-operation in supply chains and transport systems and ensuring supply of good quality labor.

The figure below summarizes the findings from the survey carried out in the project. The major common development areas and the best practices which facilitate the greening of transport corridors are presented. There are a lot of useful practices already developed. However many of these are not widely used because common desire and harmonization is lacking. With improved co-operation and harmonization in the supply chains the corridors would be greener.

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SuperGreen

Supporting EU's Freight Transport Logistics Action Plan on Green Corridors Issues

COMMON DEVELOPMENT NEEDS

Supply chain and transport operations
- *Interoperability on railways*
- *Border crossings*
- *Safety and security*
- *Financing and insurance of vessels*

ICT and Technology
- *Need to develop new ICT systems*
- *Implementation of ERTMS*
- *Harmonization of systems and data*
- *Improvements to RIS*

Infrastructure
- *Capacity of ports and rail & road networks*
- *Improvements of rail network*
- *Hinterland connections of ports*
- *Shallow water sections, insufficient lock capacities*

Policies, regulations & legislation
- *Harmonization of national regulations*
- *Customs procedures*
- *Procedures with authorities*

BEST PRACTICES:

Supply chain and transport operations
- *Increase share of the "greener" transport modes and intermodal transports*
- *Consolidation*
- *"The new sailing"*
- *Carbon auditing*

ICT and Technology
- *Sensor evaluation platform*
- Pathfinder
- *ERTMS*
- *Share of FMS data*
- *Freight exchange platform*
- *IRIS and Donau River Information Services*
- *CESAR*
- *Cleanest Ship*
- *Electrical cars*
- *Alternative fuels/energy supply for sea*

Infrastructure
- *Electrification of all rail network*
- *River engineering on the Danube*
- *Joint Statement*
- *Port electricity*
- *Extension of road capacities*
- *Green Motorway concept*

Policies, regulations & legislation
- *NAIADES, PLATINA*
- *Reduction of SOx in IWT*
- *Railway packages to revitalize railways policy*
- *Better use of Channel Tunnel capacity*
- *Antitrust exemption, incentives*

MOST FAVOURABLE AREAS FOR IMPROVING SUSTAINABILITY:

- Improvement of green supply chain design and management
- Harmonization and development of policies and regulations
- Development and harmonization of transport infrastructure and transport technology
- Harmonization and development of ICT solutions and transport documents
- Improvement of transparency of information and increase of co-operation in supply chains and transport systems
- Ensuring supply of good quality labour

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Sustainable Green Technologies and Innovations

The activity selected Green Technologies suitable to be applied in SuperGreen corridors with the purpose of improving the performance of logistics chains, with regards to energy efficiency, emissions reduction, quality of service and reliability. All surface transport modes (maritime, inland waterways, road, rail and multimodal) are covered by the analysis.

At the end of the project more than 200 candidate Green Technologies have been identified. All of them have been analyzed and classified on the basis of their sustainability potential, and 60 technologies have been considered relevant for the SuperGreen purposes. The applicability of the such technologies on specific sections (segments and nodes) of the SuperGreen corridors has been then assessed by Partners judgement.

During the last year of the project a comparative evaluation of the impacts that green technologies could have on the corridor performance compared with the baseline (state of play) has been executed. The objective was to create a benchmark of multi-modal green technologies, showing their potential greening benefits and drawbacks in comparison with conventional technologies. The effects were analysed with respect to a set of Key Performance Indicators (KPIs) related to transport cost, CO_2 and SOx emissions, average transport speed, frequency and reliability of service.

The benchmark has been created via a stepwise methodology. At first the KPIs have been decomposed into factors, linking them with the performance specifications of the green technologies. Then, the green technology performance has been analysed independently of the application area with regards to the KPI factors. Finally, the greening impacts have been assessed with respect to the current corridor performance for selected case studies (combination of a green technology and a set of corridor segments and nodes).

The results of the process show that green technologies are capable of impacting significantly on sustainability of logistics corridors. Compared to the baseline performance of road transport networks, an improvement of up to 8% in operating cost and 26% in CO_2 emissions can be achieved. The picture could change if the capital cost is included in the assessment and the return of investment is evaluated on a full corridor basis. For the analysed maritime cases, the introduction of energy efficiency measures can bring up to 20% reduction of CO_2 emissions. An improvement of about 38% on the average speed could be possibly achieved if better cargo handling systems were used. SOx after treatment systems can reduce the total transport chain SOx emissions by more than 73%. Natural gas fuels like LNG and CNG are the cleanest fossil fuels that can serve the shipping and road industries. The energy settlement systems in railways can provide with energy savings up to 15% and 30%. Finally, optimal design of waste heat recovery systems can provide economic benefits in large cargo flows with deep sea shipping.

The information gathered within the entire process is made available via the SuperGreen Knowledge Base, a web based repository for browsing the results. The tool is available for public access at the link http://88.32.124.84/SuperGreen/

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Smart exploitation of ICT flows

Among the conclusions of the SuperGreen project in the area of ICT is that it is vital to introduce new ICT technologies and policies in the corridors examined, with a view to continuously enhancing infrastructure and networks interoperability and, simultaneously, seek soft formulas to improve infrastructure utilization and service quality. The proposed solutions seem to have a positive effect on the current state of the transport process. What seems to emerge from the analysis is that in a qualitative and quantitative aspect the proposed new technologies can make logistics greener and certainly constitute a "win-win" option for logistics participants, as fuel economies, increased efficiency, and safety and reliability improvements can motivate investments in ICT systems. The proposed solutions seem to provide a good potential to further improve operations and supply chain management.

Our analysis shows how crucial the ICT systems are and drawn useful recommendations for all the transportation stakeholders. We can summarize these as follows:

1. Enhance the development of common EU transports areas with compatible characteristics. EU has already adopted this kind of prospective and moves forward towards single window applications systems and centralised ITS. (EU Directives 2010/40 on ITS and 2010/65 on Single Windows).
2. Enhance and support efforts for harmonization of EU transport attributes in terms of charging, regulations, systems, equipment, and procedures in all means of transport.
3. Support actions aiming to develop transeuropean systems or to solve compatibility issues in the EU transport industry.
4. Support actions to reassess and redesign transport regulations in EU countries. ICTs are designed based to the regulatory environment and different needs lead to disintegrated systems. The aim is to further harmonise the EU transport system and develop common transport areas.
5. Support industry benchmarking in transport solutions. Promote and support good practices and ICT systems in transport services.

In addition, even though some centralised ICTs are found to enjoy advantages vis-à-vis decentralised ICTs, mainly in terms of better opportunities in finding logistics solutions closer to the global optimum, one should exercise caution in order to avoid situations of computational intractability in their implementation. In that respect, continuous development of ICTs that are not only 'smarter' and more user-friendly but also more tractable computationally, should be a priority

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Recommendations for future R&D programmes

The main objective of this activity was twofold:

1st to identify unsolved transport bottlenecks, and perform a gap analysis regarding availability of alleviating technologies and ICT solutions

2nd based on the potential gaps; define and submit R&D recommendations for future calls

The main target of this Recommendations is the European Commission, especially DG-MOVE and DG-Research. The works was in parallel and based on the initial findings from phase one, the overall focus for this last year has been on developing a set of final and specific recommendations. Moreover, the majority of findings have been clustered around some certain development needs supporting the greening of corridors:

- Improvement of green supply chain design and management
- Harmonization and development of ICT solutions and transport documents
- Harmonization and development of policies and regulations
- Development and harmonization of transport infrastructure
- Availability of quality personnel
- Development and harmonization of transport technology, and
- Transparency of information and increased co-operation in co-modal supply chains

Furthermore, the following constitute some key efforts of the respective reports:

Identify unsolved bottlenecks: The initial analysis indicated that more of the identified corridor bottlenecks could be improved by facilitating implementation and harmonisation of existing ICT-related measures, rather than of "hard" technologies. However, based on the rationale that such greening technologies can have a mitigating effect on the negative externalities of the corridor bottlenecks, the scope of the final version of the analysis was extended by also looking for green technologies that could (significantly) contribute to reduce the consequential impact of such bottlenecks. Further, as a supplement to the traditional "bottom up" approach represented by the bottleneck investigation, a "top down" approach for identifying operational requirements, and to what extent these can be matched with existing solutions, has been carried out by identifying the requirements of the TEN-T guidelines.

Define and submit R&D call recommendations: Targeting the European Commission, DG-MOVE and DG-Research, and more specifically the new Framework Programme for Research and Innovation - the Horizon 2020, this report presents some concluding recommendations for future R&D efforts based on the work carried out throughout the project. The recommendations are provided individually for the relevant transport modes (in support of individual development needs), and with a co-modal focus supporting the development of more sustainable transport operations and green corridors. Finally, a set of call-texts supporting future development of Green Corridors has been developed. Reflecting the SuperGreen Common Development Needs above, the call texts give specific examples and suggestions on how more generic recommendations from the project can be transformed into more specific ones.

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Policy Recommendations

This project activity aimed at developing policy recommendations in relation to:

(i) the corridor approach,
(ii) quality in transport operations,
(iii) innovative technologies and practices,
(iv) integration of smart ICT applications,
(v) simplification of administrative procedures.

Among the 31 *potential* recommendations of an initial list produced last year, 15 have met the joint approval of the consortium partners, the Advisory Committee members and stakeholders that have participated in a specially arranged session of the TRA2012 conference. They are supplemented by another 5 stemming from the project's work on green technologies and smart ICTs. The resulting final recommendations are briefly presented below according to the targeted recipient. In addition, a set of recommendations is produced concerning green corridor governance and operational issues.

Recommendations to the European Commission:

- Continue using the corridor approach as a useful tool in achieving the ambitious targets of the common transport policy in Europe.
- Multimodal corridors can be viewed as vehicles for addressing wider objectives of the European transport policy, like modal integration, simplification of administrative formalities, internalisation of external costs and the harmonisation of safety, security and social legislation
- The EU should facilitate good practice in relation to the involvement of the greater public in transport planning at lower than European levels.
- In prioritising investments, the rule of maximising European added value can be accompanied by the following order of interventions:
  (a) measures affecting transport demand, modal choice, and behaviour;
  (b) measures improving the efficiency of using existing infrastructure (e.g. through ICT applications);
  (c) upgrading existing infrastructure; and
  (d) building new infrastructure and major rehabilitation of the existing one.
- The work performed on standardised estimation of transport-related external costs, with emphasis on measuring and allocating CO_2 and other emissions, needs to be continued until a universally acceptable methodology is reached.
- The Life Cycle Assessment methodology needs to be introduced in decision making.
- At least one certified carbon and environmental footprint calculator needs to be developed and the relevant action of the 2011 White Paper is fully supported.
- The European Commission can assess the possibility of developing policies that actively encourage the creation of freight villages and urban distribution centres strategically located to serve as many modes as possible.
- Policy initiatives at the Union or corridor level are recommended for collecting the statistical information needed to monitor service quality indicators.
- Develop fuel consumption standards for trucks.
- Introduce a common standard for modular logistics units enabling efficient loading and facilitating the development of open and shared logistics networks. Allow 44-ton articulated vehicles when carrying a 45 ft pallet wide container.
- Enhance information sharing at a global scale, as this is a basic pillar of supply chain integration.
- The work being performed on the e-freight initiative needs to be continued until a standard digital single European transport

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document is in operation through a single window and a one stop administration shop.
- Identify bottlenecks (including administrative) and monitor their mitigation efforts.
- Develop and bring alternative fuels to market.
- Continue the effort of developing interoperable and interconnected ICT applications in Europe.

Recommendations to the European Parliament:
- The TEN-T core network corridors can be transformed to green corridors through the promotion of state-of-the-art technologies, the deployment of ITS and the availability of alternative fuels along the routes.

Recommendations to the private sector:
- Take advantage of numerous available energy efficient technologies.
- Employ integrated logistics concepts through innovative business models.
- Develop and deploy ICT applications supporting integrated logistics solutions.

Recommendations on governance and operational issues:

A structure along the lines suggested by Regulation (EU) No 913/2010 for the rail freight corridors is suggested for the governance of green corridors. Such a structure would feature:
- an Executive Board composed of representatives of the Member States involved;
- a Management Board formed by the managers of the corridor's main infrastructures;
- an Advisory Group composed of transport operators using the corridor;
- an Advisory Group consisting of managers and owners of the terminals along the corridor; and
- a corridor one-stop-shop to serve as a contact and information dissemination point.

On the operational side, an implementation plan needs to be drafted consisting of a number of documents. Following a detailed description of the specific routes comprising the corridor, a transport market study is needed to assess customer needs and bottlenecks, and to define the objectives to be pursuit.

Furthermore, the transport market study should provide information on the actual volumes and types of goods using the selected routes based on which, a set of typical transport chains (unimodal/multimodal combinations of routes/cargoes/ loading units) should be selected to be used for performance monitoring in subsequent years. For the selected chains, the study should provide data on all KPIs to be used for monitoring performance, plus the method for combining these indices to come up with corridor level indicators. Estimates of the modal split should also be provided by the study.

A method developed for the World Bank is suggested for estimating the chain-level KPIs, as it allows consideration of the cost and time associated with both the links and nodes of a transport chain. The weights needed for aggregating chain-level KPIs into corridor-level ones depend on the relative significance of each chain in the route it belongs and in the entire corridor. As such, they have to be determined by the transport market study.

It has to be stressed that the method outlined above permits monitoring of the performance of a single corridor over time. It is not suitable for comparisons between corridors, as it does not consider differences in corridor characteristics that can be decisive in the overall performance of a corridor.