Annex 1

Task 1.3:**Assessment of the research state at the local level related to the European trends and demand analysis**

Technology field:
Non-conventional vehicles

Specific technology / solution:
Application of other non-conventional vehicles

Description of the technology / solution:

For the foreseeable future is necessary to adapt the logistical systems and supplychains to the stresses of a climate-changed world. One of the major opportunities is switching conventional vehicles to cleaner technologies powered vehicles. It is estimated that are over 1 million of vehicles on natural gas (liquefied – LNG or compressed - CNG) in the world. World Economic Forum estimates that freight transport accounts for around 90% of total GHG emissions from logistics.Among thesetechnologiesLNG/CNG is an opportunity to mitigate the carbon footprint in their fleets and, simultaneously, to decrease the operational costs. LNG andGNC is a high inflammable liquid/gas that has 80-90% of methane and is an alternative fuel considered as a clean-burning fuel. Since it contains less carbon than other fossil fuel it emits less carbon dioxide than other fossil fuels. Typically natural gas vehicles are projected to have 16% lowerCO_2 emissions compared with gasoline vehicles and 13% lower CO_2emissions compared with diesel vehicles.

There are logistics operatorsand cities that are developing strategies to increase the share of natural gas technology in their fleets. There are initiatives from DHL, Chronopost, TNT, UPS, Hermes, Nestlé Waters, Deutsch post, city of Paris, city of London and other cities in Europe.

Main applications:

- Mail distribution in cities
- Freight distribution in cities
- Home delivery of supermarket sales

- Taxi service

Use and results of applications done:

(analyse the experimentations done by cities with special regards to European programs (i.e. FP7 funded projects, Civitas and other)

Project FordonsGasa – DHL and Natural Gas Distributors cooperation scheme

During the project FordonsGasa, a Göteborg distributor of CNG/ CBG was joined by DHL, GreenCargo AB and Gatubolaged. Due to the introduction of the project, these three companies have purchased clean distribution vehicles that are utilised in their everyday business. The measure was introduced by FordonsGas, a Göteborg distributor of CNG/ CBG for vehicles. FordonsGas encountered several problems, among which was the absence of suitable vehicle models on the market (especially in the heavier segment), and the difficult of involving companies within the measures. A solution was found: during the project FordonsGas was joined by DHL, GreenCargo AB (both international logistics companies) and Gatubolaged (specialised in transport in the Göteborg area). Due to the introduction of the project, these three companies have purchased clean distribution vehicles that are utilised in their everyday business.

The measure has resulted in one fuelling station, 16 distribution vehicles (Mercedes Sprinter and Ford and 2 heavy-duty vehicles (Scania and Mercedes). The fuel station has delivered 660,000 Nm^3 CNG since it was opened in March 2003. The vehicles have decreased CO_2 emissions by 72.8 tons and NO_x by 83 kg. The vehicles will within 1 years' time drive app 500,000 km on CBG instead of Diesel. The project itself shows how actors from different parts of the chain of transportation can co-operate to change directions from conventional distribution to new environmentally friendly ways of distribution.

(Additional information: http://www.eltis.org/index.php?id=13&study_id=1167)

TNT Carrier Case in Germany

In Germany TNT uses 145 CNG vehicles in a universe of 1.800 vehicles (8%). The main driver for the use is the government incentive to of a dedicate model of CNG-vehicle. It is subventioned 10 % of the acquisition value. Other drivers are responsibility for the environment (ISO 14000 Standards), the necessity to bring down the emission of vehicles that delivers goods in city centres and to have choicesdue to the Diesel rising costs. (Additional information: http://www.eltis.org/index.php?id=13&study_id=792)

Hermes Versand Service (Germany)

Hermes is testing the capabilities of alternative propelled vehicles within its fleet in different German cities (Hamburg, Hannover, Berlin, Lüneburg, Bremen, Augsburg, Stuttgart).For carrying out the CNG trials Hermes purchased 15 vehicles. Due to the positiveresults from these trials a further operation is in consideration (Hermes is favouringa leasing of the vehicles). The vehicles are mostly standard vans refitted with alternative propulsions. The CNGvans were refitted diesel vans (bivalent technology). The main objectives have been: ecological (reduction of noise emission) and economic. The initiative has detected economic barriers .High investment costs for fuel as well as for the propulsiontechnology (triple of the vehicle investment cost and double of the fuel costscompared to diesel propelled vehicles). The detected benefit is related with environmental advantages CO_2, noise and energy efficiency.

(Additional information: http://www.osmose-os.org/documents/195/Germany_Env_vehicles.pdf)

Green Trucks in Paris

The city of Paris tested 26 ton CNG IVECO trucks by GEODIS for the transport of Monoprix products to supermarkets.

The city of Paris promotes alternatives to road transport and supports logistics organizations based on the use of railways or waterways. The re-use of a traditional rail freight terminal in Paris by Monoprix is a successful example of this policy.

Monoprix is a French retail group with more than 300 urban supermarkets in France. In November 2007, the first Monoprix train ran from Monoprix's suburban warehouses to Paris Bercy rail station, within the city's limits (in the Bercyneighborhood). This represents a 30 km

rail link. The Monoprix train uses passenger trains' tracks at off-peak hours. Integrated with the rail, CNG (compressed natural gas) trucks deliver pallets to 65 Paris supermarkets and 25 supermarkets in adjacent suburbs.

(Additional information:

http://www.unhabitat.org/downloads/docs/GRHS.2013.Case.Study.Paris.France.pdf.

DHL Deutsche Post – Bremen city experience

A result of consultation between the city and the freight industry in a Green Transport Working Group led to the creation of an environmental loading point, which provides extended access to the pedestrian area of the city only to "clean" freight vehicles. The measure was implemented in 2007 and involved the creation of two 8.5 metre dedicated parking bays close to the pedestrian zone in the Old City of Bremen for the exclusive use of Euro V vehicles. This encouraged DHL Deutsche Post to buy five IVECO Daily CNG delivery vans, which comply with the highest European emission standard (EEV, Enhanced Environmental Vehicle). Unfortunately, the dedicated use of the ELP for Euro V vehicles cannot be enforced because national laws in Germany do not allow public parking space to be dedicated to any particular user.

(Additional information: http://cordis.europa.eu/result/brief/rcn/3633_en.html)

CIVITAS – VIVALDI PROJECT in Bremen

Within the VIVALDI project, the objectives were to introduce economic and environmentally friendly trucks running on compressed natural gas (CNG). Despite great efforts, it was not possible within the project period to purchase any CNG trucks in the planned weight class, as there were none offered by the motor industry.

(Additional information: http://www.civitas.eu/content/introducing-compressed-natural-gas-trucks)

CIVITAS – TELLUS PROJECT in Berlin

The tri-modal inner-city logistics centre in Westhafen is managed by BEHALA, the Berlin harbour and storage company. Its central location encourages environmentally friendly inland water navigation and railway traffic, so that only short distances have to be covered by lorry.BEHALA pursued its goal of reducing the negative environmental impacts of freight

transportation by supporting the introduction of environmentally friendly CNG-powered lorries.Technical information for haulage companies was prepared in order to introduce CNG-powered lorries for the haulage of goods from the port, although there was no supply of heavy goods CNG lorries for transporting containers.

(Additional information:http://www.civitas.eu/content/establishing-inner-city-logistics-centre;

https://www.google.pt/url?sa=t&rct=j&q=&esrc=s&source=web&cd=10&cad=rja&ved=0CG8QFjAJ&url=http%3A%2F%2Feltis.org%2FPDF%2Fgenerate_pdf.php%3Fstudy_id%3D2305%26lan%3Den&ei=jmbmUpCyKe6p7AbAhoCQCg&usg=AFQjCNGZK7bwCNEuqKPpw_uYZApGbJbz5g&sig2=P1XLizPBj3aqZN6h0mw0Mw)

NG Taxis in Lisbon

In Lisbon, which receives approximately 400,000 vehicles per day, there are up to 20 taxis running on natural gas, a universe of 3500, due to the lack of a recharging infrastructure.

(Additional information: http://www.cumprirquioto.pt/measures/MeasureDatasheet.action?measureDatasheet.id=260000&sector=TRANSPORTS& fsk=-685845761;

http://www.cmjornal.xl.pt/detalhe/noticias/nacional/portugal/taxis-a-gas-natural)

NG vehicles in garbage collection in Lisbon

Most of the municipal fleet affects the collection of solid waste Lisbon will consist of trucks to natural gas (CNG) by 2013, announced the Mayor of Lisbon, Antonio Costa. "We will get to 2013 with 80 percent of the waste collection fleet fueled by natural gas," said the mayor, referring to the authority invested in a "active policy of substitution of energy sources for vehicles."

(Additional information: http://www.transportesemrevista.com/Default.aspx?tabid=210&language=pt-PT&id=3870)

Perceived potential:
(describe the potentialities of the analysed topic in terms of future applications, impact on the process, innovation, etc.)

A bottleneck for CNG vehicles is the insufficient infrastructure of filling stations. There is also little market availability. Future applications should assure the filling stations. Innovation in terms business models between logistic operators and natural gas distributors should be deeply studied in order to have a win-win model.

RTD activities in progress

(describe the RTD activities in course, or the possible envisaged RTD needs)

- Test and experiment new business models to introduce CNG vehicles in logistics chains
- Development of new CNG engines
- Study of financing schemes to introduce CNG in logistics operators
- Low cost CNG Fuelling Infrastructures
- Analyse the environmental impact of vehicle exhaust emissions associated with the increased use of CNG vehicles in logistics operators