

benefits both to owners and tenants. The return on investment should be kept below 7 years, taking into account that the establishment of effective cooperation among stakeholders in the value chain will increase overall efficiency and introduce economies of scale for large take-up. Non technological barriers should be properly addressed.

**EeB.NMP.2011-4                      Geo-clusters approach to support European energy-efficiency goals**

**Technical content/scope:** Local practices and the operational framework concerning energy-efficient buildings differ widely across the EU. The situation depends often on regional preferences with regard to the processes, materials and technologies in use, as well as social and economic aspects. There is a need for a coordination action:

- To further investigate the geo-clusters concept conceived as virtual transnational areas/markets where strong similarities are found, for instance, in terms of climate or geography, culture and behaviour, construction typologies, economy and energy/resource pricing policies, GDP per capita, but also the types of technological solutions or building materials available. This requires the identification of those EU areas where the building stocks present such similarities.
- To create, in synergy with existing systems a repository of structured information on all EU wide services and tools in energy efficiency and construction, including indicators, best practices and experience with existing demonstrators as well as available technologies ready to be used in the existing building stock. These solutions should allow common EU standards and parameters to be defined, thus improving the relationship between the citizen and the energy aspect.
- To develop a technology map with a dynamic geo-database web service, based on the geo-clusters concept where different technologies and research challenges can be placed, in order to contribute to the development of appropriate business strategies and maximise the chances for a wider implementation of the technologies that can deliver a higher impact. Solutions should be assessed having in mind Least Life Cycle Costs (LLCC) in order to contribute to EU policies.

Methodology and developed tools to process acquired data, design, model, simulate and predict energy efficiency should take into account the buildings and the district dimension within each geo-cluster.

**Funding scheme:** Coordination and Support Action (coordination action)

**Expected impact:** The availability of an extensive set of validated data and indicators for key geographical areas will allow to properly define requirements and specifications for technology development and integration, as well as the fine tuning of demonstration actions in order to maximise impact. Non technological aspects will be instrumental for the full take-up of the geo-clusters concept and should be able to leverage the expected outcomes. The direct/indirect involvement of a wide range of stakeholders guided by a clear industrial vision and a comprehensive coverage of the industrial value chain in energy-efficient buildings.

**II.5.3 "Green Cars (GC)" - Public-Private Partnership –**

**Cross-thematic cooperation between NMP, ICT, Environment (including Climate Change) and Transport (including Aeronautics)**

The automotive industry is one of Europe's key industrial sectors, whose importance is largely derived from its linkages within the domestic and international economy and its complex value chain. It is estimated to account for close to 8% of total manufacturing value added (ca. EUR 120 billion, 2006) and about 6% of total manufacturing employment (over 2 million employees). The automotive industry also provides an indirect employment to 10-11 million persons and is one of the largest RTD investors in the EU with over EUR 20 billion annually (ca. 5% of its turnover)<sup>11</sup>.

The foreseeable shortage in crude oil based energy carriers is driving fears about energy security: 73% of all oil consumed in Europe is used in transport and estimates predict a doubling of passenger cars within the next 20 years. From an environmental and energy point of view there is an urgent need to find alternatives to fossil fuels in order to secure future energy supply, to guarantee the availability of appropriate material recycling technologies, and to reduce greenhouse gas emissions and other potential environmental impacts related to the automotive industry entire life-cycle. It is thus increasingly evident that a particular emphasis should be put on the rapid development of technologies supporting the massive emergence of more efficient and sustainable road transport solutions based on alternative fuels/energy, and on the RTD efforts associated with them.

The *'European Green Cars' PPP Initiative* is a series of measures boosting research and innovation aiming at facilitating the deployment of a new generation of passenger cars, trucks and buses that will spare our environment and lives and ensure jobs, economic activity and competitive advantage to car industries in the global market. A series of different measures are proposed: support to research and innovation through FP7 funding schemes, specific EIB loans to the automotive and other transport industries and its suppliers, in particular for innovative clean road transport, and a series of legislative measures to promote the greening of road transport (circulation and registration taxes, scrapping of old cars, procurement rules, the CARS21 initiative).

Other actions that are very closely related to the *'European Green Cars'* Initiative but not formally included in it are being implemented, such as the *'Fuel Cell and Hydrogen'* (FCH) Joint Technology Initiative and the road transport projects funded under the FP7 Transport Theme.

The *'European Green Cars'* Initiative includes three major research and development avenues within its RTD pillar:

- **Research for heavy duty vehicles based on internal combustion engines (ICE)** [Sustainable Surface Transport sub-theme (SST)]: The research will primarily concentrate on advanced ICE with emphasis on new combustion, the use of alternative fuels (e.g. bio-methane), intelligent control systems, 'mild' hybridisation (use of recuperated electricity to power the auxiliary systems) and special tyres for low rolling resistance.
- **Research on electric and hybrid vehicles:** This component will be the most essential in this package. To have a real impact on the green economy, research in this field should no longer focus on electric vehicle technologies seen in isolation from the rest of the transport system: a massive introduction of the technology requires the availability of smart electricity grids and intelligent vehicle charging systems tailored to customers' needs.
- **Logistics and co-modality** combined with **intelligent transport system** technologies are essential to optimize the overall system efficiency and sustainability avoiding for example that empty trucks circulate on highways due to sub-optimal logistics. In this respect, smooth and co-operative interactions between the different transport modes will be essential.

The 2011 Work Programme focuses on the second research avenue: electric and hybrid vehicles and their infrastructures. Three groups of topics covering collaborative research activities as well as coordination and support actions are included:

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<sup>11</sup> "European industry – a sectoral overview, 2006 update, EC-DG ENTR

- Materials, technologies and processes for sustainable automotive electrochemical storage applications, implemented through a call jointly implemented with other Themes.
- Research on electric and hybrid vehicles, implemented through the Sustainable Surface Transport (SST) sub-theme of the Transport Theme.
- Information and Communication Technologies for the fully electric vehicle, implemented through the ICT Theme.

**"Green Cars" (GC) – Topic implemented jointly by NMP, Transport (including Aeronautics) and Environment (including Climate Change) Themes**

The call is implemented jointly by the NMP, Transport and Environment Themes. The indicative budget of the NMP part for this "Green cars" PPP initiative is EUR 10 million in 2011, with the Transport Theme contributing also EUR 10 million, and the Environment Theme contributing EUR 5.5 million. The European Union funding part of the indicative budget of the Call is thus EUR 25.5 million.

**GC.NMP.2011-1                      Advanced eco-design and manufacturing processes for batteries and electrical components.**

**Content/scope:** Further development and deployment of electrical vehicles call for large scale production of batteries and electrical components with good performances and at the lowest possible cost. Research shall address the whole value chain including the eco-design, assembly/integration and production of batteries and electrical components (motors, battery management systems, etc.). Eco-design should properly account for the relevant dismantling, recycling/disposal, and health and safety aspects of critical materials.

- For near-to-market types of lithium-based batteries, projects should focus on manufacturing processes of cells but also on their integration into manageable battery modules and packs. Advanced manufacturing processes of battery cells, should be flexible enough or reconfigurable to cope with new chemistries. Special attention should be devoted to thermal management systems and safety issues, which are critically dependant on battery system design.
- For electric drivetrains and in particular motors, the main challenge of cost reductions is to be achieved by design improvements in order to produce lighter systems with increased power density, while at the same time taking into account the availability of critical materials and their dismantling/recycling. Projects should not include design or manufacturing of the power chips themselves.

For a significant industrial benefit, it should be possible to integrate the advanced manufacturing tools, methodologies and processes developed within the project into conventional or already existing production lines or, in case of new architectures, include new methodologies. In both cases the projects are expected to cover small-scale production-line demonstrators. The environmental improvements achieved should be proven via ILCD-conform Life Cycle Assessment. The feasibility of the dismantling/recycling process for motors should be proven at least at bench/pilot scale for the most critical materials. In order to ensure the industrial relevance and impact of the research effort, active participation of industrial partners, including SMEs, components suppliers, electrical vehicle manufacturers and component recyclers, represent an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

The work should be complementary to the objective GC-ICT-2011.6.8 'ICT for fully electric vehicles'.

**Funding Scheme:** Large-scale integrating collaborative projects.

**Additional eligibility criterion:** The EU contribution requested must be greater than EUR 4 million.

**Expected impact:** Establishing the basis for a world level European automotive battery and electrical components manufacturing industry. In particular production of cells, battery packs, electrical motors and components with the required performances at competitive costs. Reduction of waste production and improvement of resource efficiency through a more efficient recycling of critical materials.