PPP - “European Green Cars Initiative”
Materials for Green Cars

FP7 NMP and Cross-Thematic Call jointly implemented between NMP, TRANSPORT* and ENVIRONMENT** Themes

* Including Aeronautics
** Including Climate Change

European Commission
DG Research and Innovation
Industrial Technologies
Unit G3 - Materials

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Public Private Partnership
European Green Cars Initiative

- Recovery Package - Objective for GREEN CARS:
  Supporting the emergence of more efficient and sustainable
  hybrid and electric cars, funds: 1.0 billion € in 4 years

- Successful implementation of the EGCI PPP
  managed to deliver results in quick and efficient manner

- Moreover, the « Innovation Union » Flagship Initiative calls for
  an integrated instrument for research and innovation
Why another specific call on Materials?

- Green car – paradigm shift
  Lighter, more sustainable cars → new concepts needed

- Novel materials allow the conception of new products -
  a considerable part of all innovation is based on new materials

- In WP 2010/11/12 Concentration on materials for electric cars
Materials for Green Cars WP 2010-2012

Topic with cross thematic interest

- **WP 2010** battery materials and electrical components
- **WP 2011** battery manufacturing
- **WP 2012** battery materials - post Li (NMP Theme only)
- **WP 2012** structural materials (cross thematic)
EGCI - Materials for Green Cars Call 2012

2 call topics

1) Innovative *automotive electrochemical storage applications based on nanotechnology* (NMP Theme only)
   GC.NMP.2012-1

2) Innovative advanced *lightweight materials for the next generation of environmentally-friendly electric vehicles*
   GC.NMP.2012-2 / GC.SST.2012.1-1 / GC.ENV.2012-6.6.3
   *(Joint Call of NMP - SST - ENV Themes)*
EGCI - Materials Call – 1st topic – info 1

Innovative automotive electrochemical storage applications based on nanotechnology

- **Funding Scheme:** Small/Medium Scale Collaborative Projects
- **Maximum Funding:** 3,000,000 €
- **Budget:** 10 M € (NMP only)
- **Eligibility conditions:** general conditions for SSCP
Innovative automotive electrochemical storage applications based on nanotechnology

- Lithium ion technology is still not satisfactory for long distance EV use. More energy density, power density, cost and safety improvements are needed. Although the development of second generation Li-ion batteries delivering roughly double the energy density (200Wh/kg to 300Wh/kg) is in progress (with a target implementation of 2015 to 2020), post Li-ion rechargeable batteries – solid-state, Li-S, or metal-air batteries, for example – are expected to provide a long term solution to current range and cost issues.
EGCI - Materials Call – 1st topic – info 3

Innovative automotive electrochemical storage applications based on nanotechnology

- Projects shall exclusively address the development of innovative materials and technologies for battery components, material architectures and systems for automotive electrochemical storage at cell level within a responsible, sustainable and environmental-friendly approach looking at the entire life cycle. Activities shall focus on the understanding of the phenomena which affect the battery properties at the nanoscale across a full cell, including modelling and simulation.
EGCI - Materials Call – 1st topic – info 4
Innovative automotive electrochemical storage applications based on nanotechnology

• **Research** shall focus on innovative technologies, architectures and chemistries and **should address the following issues**:
  • performance, safety, recyclability and cost;
  • potential for fast charging without significant life reduction;
  • effect of bidirectional flow at charge stations;
  • availability of constituent materials;
  • eco-design and material production;
  • characterisation, standardisation and synergies with other applications.

• **Proof of concept** in terms of product and/or process is encouraged as is participation from the manufacturing industrial sector within strong interdisciplinary consortia.
Innovative automotive electrochemical storage applications based on nanotechnology

- Proposals for electrochemical capacitors are excluded, as these have been extensively covered in a previous Green Cars call.

- Expected Impact: (i) High energy densities with respect to the state-of-the-art (i.e. higher than 400 Wh/kg); (ii) Overall performance, safety, recyclability and life-cycle sustainability; (iii) A minimum lifetime of 3000 cycles in a 80% DoD* window in typical automotive conditions over 10 years; (iv) Establish and maintain world-class status for the European automotive battery industry.

* DoD = Depth of Discharge
EGCI - Materials Call – 2nd topic – info 1

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

- Funding Scheme: *Large Scale Collaborative Projects*
- Minimum Funding: *4.000.000 €*
- Maximum Funding: *10.000.000 €*
- Budget: *25 M € joint from NMP SST ENV Themes*
- Eligibility conditions: *general conditions for LSCP*
EGCI - Materials Call – 2nd topic – info 2

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

• Research proposals should focus on the development of advanced materials for cars and light-duty vehicles, contributing to an accelerated market introduction of new energy-efficient electric vehicles, while ensuring sustainability and viability by rapidly achieving the appropriate economies of scale.

• The research proposals should address also several of the following issues or all of them:
Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

- **Reducing the structural weight**, e.g. by deploying light alloys, thermoplastics, carbon or other fibre-reinforced polymers, composites, honeycombs, foams, advanced steels and tailored, multifunctional materials into the body parts, chassis and heavier interior systems, and including e.g. optimisation of structural layouts, multi-functional design, numerical simulation, testing, prototyping and/or manufacturing processes. Standardization issues should be considered;
EGCI - Materials Call – 2nd topic – info 4

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

- **Exploiting new materials characteristics in association with the innovative structural layouts made possible by new electric vehicles, in order to improve safety by enhanced energy absorbing capability. For instance, this could allow to better deal with asymmetric crash conditions (opponent of higher size and weight) in the case of very light vehicles. Fire resistance of the proposed advanced materials should be taken into account, where appropriate;**
EGCI - Materials Call – 2nd topic – info 5

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

• Addressing related production process challenges, in particular developing suitable forming and joining technologies, to guarantee reliability, robustness and safety (e.g. guaranteeing that crash performance as tested does not degrade over time), reducing the cost of assembly while permitting a wide range of vehicle variants;

• Assessing the performance of the behaviour of the advanced materials and the respective components and systems under typical operational and extreme loading conditions (e.g. with respect to durability and safety) and external environment (e.g. for corrosion resistance), including the potential for accelerated lifetime testing while ensuring reliability;
Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

• Carrying out of an appropriate life-cycle analysis of the advanced materials and the respective components and systems, including dismantling and recycling technologies; for brand new materials, a recycling method should be outlined with appropriate lab-scale experimental part;

• Carrying out an economic analysis, including material resources availability and costs, that demonstrates the real advantages of the new materials over conventional ones. Trade-offs between the extra cost of lightweight design and possible gains from lower lifetime costs for energy consumption and emission of vehicles should also be assessed.
EGCI - Materials Call – 2nd topic – info 7

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

• **While the focus of the proposal should be on electric cars, the potential for synergies with other types of environmentally-friendly vehicles or the cabs of heavy-duty vehicles can also be taken into account.**

• **In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners (including SMEs) represents added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact**
Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

- Proposals may
  (i) include research results validation and the physical demonstration of the performance achieved with the innovative advanced material(s), e.g. even via a complete body in white structure or vehicle demonstrator,
  or (ii) consist of focused research, limiting validation of the innovative advanced material(s) to substructure level.

- Special Features: The proposed projects should not duplicate similar FP6 or FP7 projects, e.g. projects funded under the FP7 European Green Car Initiative. Coordination or ex-ante clustering with projects in topic GC.SST.2012.7.1-5 can be foreseen
EGCI - Materials Call – 2nd topic – Info 9

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

• Expected Impact:

(i) Considerable weight reduction: a 30% body in white weight reduction was already demonstrated in recent EU projects on conventional vehicles; a further 20% reduction (taking into account the higher acceptable cost) is to be demonstrated, with the relevant safety, energy efficiency and environmental benefits; and/or

(ii) Overall reduction in time-to-market and development costs while increasing product flexibility;
EGCI - Materials Call – 2nd topic – Info 10

Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles

and

(iii) Economic viability and technological feasibility of the advanced materials and the related processes with reference to real applications of industrial relevance;

and/or

(iv) Options for the use of globally available, recyclable or recycled, and carbon-neutral materials;

and/or

(v) Extended lifetime of durable components of a vehicle and lower life-cycle costs
EGCI - Materials Call – other Information

Materials for Green Cars (both topics)

• Call publication date: 20 July 2011
  - draft already on RTD website
• Submission deadline: 1 December 2011, 05:00 P.M. Brussels time
• Evaluation: January 2012
• Negotiation: foreseen March 2012
EGCI - Materials Call – other Information

Materials for Green Cars (both topics)

Evaluation procedure: 1 step procedure

Evaluation criteria:

• S/T quality: minimum threshold 3/5
• Implementation: minimum threshold 3/5
• Impact: minimum threshold 3/5
• Overall: minimum threshold 10/15
EGCI - Materials Call – other Information

Materials for Green Cars (both topics)

General Information:

- Cordis Website http://cordis.europa.eu/home_en.html
- RTD Website http://ec.europa.eu/research/index.cfm
  Select: « areas of research », and
  Industrial Technologies/Environmental Research/Transport
- Specific ETP sites: ERTRAC, EPoSS
EGCI - Materials Call – other Information

Materials for Green Cars (both topics)

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