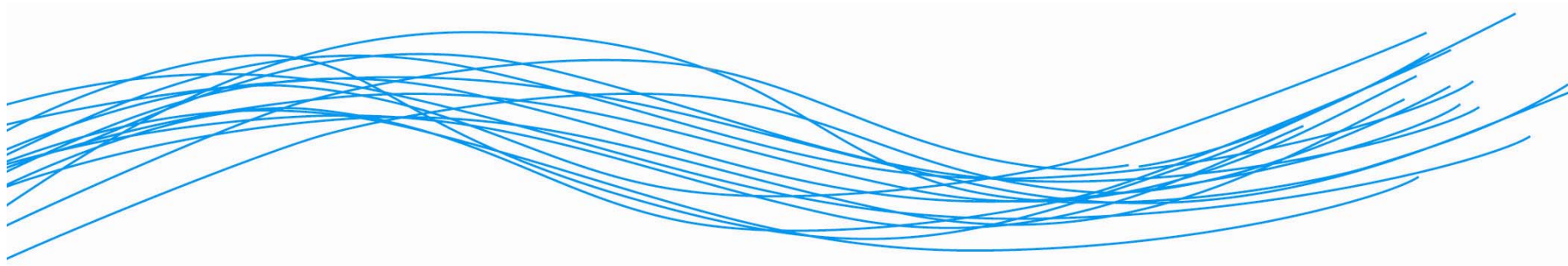


European Green Car Initiative and the Sustainable Surface Transport WP



Results from the first EGCI calls on Electric Vehicles

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Sustainable Surface Transport
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European Green Cars Initiative a response to the crisis

- Three Public Private Partnerships launched to support critical industries. EGCI is one of them
- Demand side measures & public procurements: **reduction of circulation & registration taxes for low CO2 cars, scrapping schemes**
- EIB loans **in support of research & industrial innovation Budget: €4 billion (in addition to existing loans)**
- R&D **mainly through FP7. Budget: €1 billion (500 million from FP7 matched by €500 million from Industry and Member States)**
- This is only partly dedicated to Evs (around 50-60% in average), part to trucks and logistics

- **The research part of the EGCI has started in earnest with the launch of the first specific calls two years ago**
 - ▶ One in DG INFSO
 - ▶ One in DG MOVE
 - ▶ Two in our Directorate general
- **It followed the first two calls of FP7 in which several HEV-related projects were funded (HCV, HELIOS)**
- **Two HEV related FP6 projects (HICEPS and HYTRAN) still running**

- **The 2009 DG INFSO call**
 - ▶ The evaluation was completed in February, negotiations have been completed and the projects are running
 - ▶ Seven retained proposals covering:
 - Concepts for overall efficiency gains
 - Safe subsystems and active safety
 - Electric architectures
 - Driver assistance and V2X systems

Call FP7-SST-2010-RTD-1

- Date of publication: 30 July 2009
- Deadline: 14 January 2010
- Total indicative budget: 108 M€
- Funding schemes:
 - ▶ CP: Collaborative Projects
 - ▶ CSA: Coordination Support Action

- **The 2010 DG MOVE GC topic**

- ▶ The call targeted wide scale demonstrations of electric vehicles
- ▶ Not only vehicles, but mainly infrastructure will be covered,
- ▶ Standardisation, business models and user acceptance very important aspects
- ▶ Strong links and complementarity expected both with national and regional demos and important running projects, such as the recently started ones by the RTD-Energy directorate exploring the potential of batteries on board EVs to serve as support for the electricity grid and the integration of renewables
- ▶ Selected project GREEN E-MOTION just launched

- **The joint call on electrochemical storage (1)**

- ▶ Four directorates involved, jointly developing the call and evaluating the proposals
- ▶ A remarkable success, attracting 25 high level proposals of which seven have been funded
- ▶ A clear trend was towards metal air battery, with chemistries capable of delivering greatly improved range vs the best current Lithium cells. LABOHR proposal was selected.
- ▶ Four selected proposals on significantly improving lithium performance, cost, safety and environmental features (getting away from costly/risky nickel, cobalt, organic electrolytes...)
- ▶ SOMABATT has the objective to recycle active electrochemical compounds
- ▶ Two of the selected projects propose to improve supercaps performance, either instead of batteries (in hybrids) or together with high energy cells to "protect" them. ELECTROGRAPH will look into graphene for a breakthrough

- **The 2010 Transport directorate call (1)**

- ▶ A total of 49 proposals have been submitted. Two were deemed out of scope, 17 of the remaining 47 have been selected (plus one in the reserve list). Currently under negotiation, first projects launched in one-two months
- ▶ Some trends can be already extracted, looking at the main technical topics
- ▶ **Electric machines**
 - ◆ Large interest in this topic, 11 proposals received
 - ◆ The strongest interest was for very compact, innovative permanent magnet motors with work on reducing strategic materials content and optimised design for production to reduce costs.
 - ◆ HIWI and IMAGINE selected, second dropped
- ▶ **Electric Auxiliaries**
 - ◆ Only three proposals received
 - ◆ High quality, looking at cooling and heating, clearly the dominating issue on auxiliaries for pure EVs for the proposers.
 - ◆ ICE and SMARTOP selected, second dealing also with PV integration for energy harvesting

- **The 2010 Transport directorate call (2)**

- ▶ **ICEs for range extender/plug in hybrid applications**

- ◆ Good interest (seven proposals), but two diametrically opposed trends
- ◆ On one end, application of traditional engines
- ◆ On the other, very innovative applications with no or little previous work and therefore high risk
- ◆ FUEREX and LIBRALATO proposals selected

- ▶ **Battery integration**

- ◆ Good number of proposals (six), looking at how better to physically integrate both fixed and removable batteries.
- ◆ SMARTBATT interest in crashworthiness to protect this very valuable item
- ◆ Thermal control another point of interest
- ◆ Battery swap technology also well covered in EASYBAT

- **The 2010 Transport directorate call (3)**

- ▶ **Advanced vehicle architectures**

- ◆ The highest number of proposals, 14 in all
- ◆ Very wide topic description, open to both system level concepts (new vehicles) and detailed technologies (lightweight materials, aerodynamics, EMC issues, crashworthy concepts etc)
- ◆ Good proposals of both types received, and some integrating both general and detail aspects
- ◆ Some looking at a wide level exploration of possible vehicle architectures
- ◆ Small urban vehicles dominating as a whole, WIDEMOB selected in this area
- ◆ More generic, parametric study also selected
- ◆ Some in the light vehicle (quadricycle) category, where crash and other requirements are less stringent

Call FP7-SST-2011-RTD-1

- Date of publication: 20 July 2010
- Deadline: 2 December 2010
- Total indicative budget: 67M€ (all topics)
- Funding schemes:
 - ▶ CP: Collaborative Projects

DG RTD

SST 2011 Call

Transport Theme

- **TOPIC – GC.SST.2011.7-1**

Specific safety issues of electric vehicles

- ▶ **Objective:** The presence of high voltages and potentially hazardous chemicals and the absence of engine noise pose specific problems to EVs. The expected impact of the first subtopic should be technologies and procedures that avoid additional casualties to the current level due to electrocution risks. The second subtopic should produce systems and technologies capable of giving effective warning to vulnerable users at a sufficient distance while maintaining the advantages of electric technologies in terms of improving the current road noise environment.
- ▶ **Coverage:**
 - ◆ Innovative topologies and concepts (including fault tolerance or mitigation) for various applications.
 - ◆ Safe plug-in/re-charging, prevention of misuse/abuse, protection against fire and electric shocks during maintenance or after a crash
 - ◆ Acoustic perception of the FEV, raising awareness of vulnerable users including the application/adaptation of existing pedestrian protection systems (active safety) to the raised needs.
- ▶ **Funding schemes:** CP Small/Medium scale – Level 1– Funding < 3M€

DG RTD

SST 2011 Call

Transport Theme

- **TOPIC – GC.SST.2011.7-2**

Integrated thermal management

- ▶ **Objective:** develop cost efficient and industrially viable integrated thermal systems for long range, reliable and comfortable electric vehicles when no waste heat source is available.
- ▶ **Coverage:**
 - ◆ Improvement of the efficiency of the thermal control of the energy storage system, independently of the actual ambient temperature.
 - ◆ Optimization of the impact of the thermal comfort of the users on energy consumption through innovative, light, cost efficient, electronically controlled materials and their integration aspects (new insulating materials, active glazing, local heating, etc.).
 - ◆ Development of cost effective thermal management systems of the power train during charging, operation of the vehicle as well as during parking periods.
 - ◆ Cooling aspects of the electric motor in combination with a ICE range extender or auxiliaries.
- ▶ **Funding schemes:** CP Small/Medium scale – Level 1– Funding < 3M€

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DG RTD

SST 2011 Call

Transport Theme

- **TOPIC – GC.SST.2011.7-10**

Architectures of Light Duty Vehicles for urban freight transport

- ▶ **Objective:** novel electrified LDV concepts and solutions (conversions are excluded) to enable efficiency gains for mobility and the transportation of goods in the urban environment, e.g. last mile delivery and other applications such as the powering of tools. The development of complete vehicle concepts is envisioned and a strong industrial participation is recommended. Higher energy efficiency (at least 40% reduction in terms of primary energy consumption) should be demonstrated with respect to best of class vehicles in the same category, while achieving a range adequate to the typical daily urban mission
- ▶ **Coverage:**
 - ◆ Usability in the urban environment.
 - ◆ Optimized structural layout aiming at improving weight and crashworthiness.
 - ◆ Modularization of subsystems and standardization of components for low cost and high efficiency
 - ◆ The above considering safety, EMI/EMC and radiation health impact issues, maintenance and repair, while exploiting the significant opportunities offered in terms of layout and packaging, functionality, and construction
- ▶ **Funding schemes:** CP Small/Medium scale – Level 2– Funding < 3M€

All other EGCI Calls

- **TOPIC – GC.SST.2011.7-7**

Advanced eco-design and manufacturing processes for batteries and electrical components – total budget 25.5 M€

- **TOPIC – GC.SST.2011.7-8**

ERA-Net Plus 'Electromobility' - included in 67 M€

- **All logistics/urban topics - included in 67 M€**

- **TOPIC – GC.SST.2011.7-8**

ICT for fully electric vehicles– total budget 30 M€

DG RTD

2011 Joint Call

NMP, Environment, Transport Themes

- **TOPIC GC.SST.2011.7-7/GC.NMP.2011-1/GC.ENV.2011-3.1.3-1**
- **Advanced eco-design/manufacturing processes for batteries/electrical components**
 - ▶ **Objective:** Support low cost large scale production of batteries and electrical components addressing the whole value chain including the eco-design, assembly/integration and production of batteries and electrical components (motors, battery management systems, etc.) as well as dismantling, recycling/disposal, and health and safety aspects of critical materials.
 - ▶ **Coverage:**
 - ◆ For near-to-market types of lithium-based batteries, focus on manufacturing processes of cells, their integration into modules and packs. Processes should be flexible enough or reconfigurable to cope with new chemistries. Special attention to thermal management systems and safety issues.
 - ◆ For electric drivetrains and in particular motors, focus on cost reductions by design improvements to achieve higher power density, taking into account the availability of critical materials and their dismantling/recycling. No work on power chips
 - ◆ 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.
 - ◆ Active participation of industrial partners, including SMEs, components suppliers, electrical vehicle manufacturers and component recyclers, represents an added value.
 - ▶ **Funding schemes:** CP Large scale – Funding > 4M€

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DG INFSO 2011 Call

- **TOPIC – FP7-2011-GC.ICT.2011.6-8a**

Control system solutions for batteries and/or super-capacitors

- ▶ Electronic **architectures** for managing optimal charging and discharging rates
- ▶ **Sensors and networking capabilities** for monitoring and controlling the energy/power storage system's efficiency, lifetime, reliability and safety, including monitoring and early warning of fault conditions environmental monitoring, temperature conditioning and shock protection/spark avoidance
- ▶ High voltage **switches and interconnects** and system interfaces.
- ▶ Funding schemes: STREP

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● TOPIC – FP7-2011-GC.ICT.2011.6-8b

Architectures for Energy, Communication and Thermal Management

- ▶ Optimised distribution for **multiple voltage systems** for:
 - ◆ power-train, bilateral grid connection, onboard energy harvesting, heating and cooling conditioning systems, vehicle stability and comfort, lighting, driving assistance sensors, on board information and entertainment and other auxiliaries.
- ▶ **Real-time and fail-safe** standard communication systems
- ▶ Funding schemes: STREP

- **TOPIC – FP7-2011-GC.ICT.2011.6-8c**

Vehicle-to-grid Interface (V2G)

- ▶ **Controlled flow of energy**

- ◆ safe, secure, energy efficient and convenient transfer of electricity and data
- ◆ E/M compatibility, robustness, reliability, safety, security and impact on health and grid stability

- ▶ **Platform-independent solutions** based on pan-European consensus and conform to interface standards for Smart Grids

- ▶ **Funding schemes: STREP**

● TOPIC – FP7-2011-GC.ICT.2011.6-8d

Vehicle Stability Control

- ▶ Stability control **architectures** with 2, 3 or 4 electrical motors
- ▶ Vehicle **dynamics** simulation
- ▶ **E/M compatibility**
- ▶ **Bus-based solutions**
 - ◆ standardised, safe and redundant
- ▶ **Regenerative braking**
- ▶ **System faults** like maximum torque / oscillating torque at a single wheel / two wheels
- ▶ Controlled **shut-down procedures** in case of crash
- ▶ Funding schemes: STREP

Submitted proposals

- Number of proposals received: 145
- Proposals ineligible (before evaluations): 5
- Proposals ineligible (out of scope) during evaluations: 2
- Proposal evaluated: 138
- Available funding: 91,25 M€
 - ▶ Rail: 26 M€, Water: 26 M€, Green Car: 30,25 M€, Gaps 9M€
- Total requested funding: 358,8 M€



WP coverage of submitted and retained proposals

- Coverage by Group of Topics

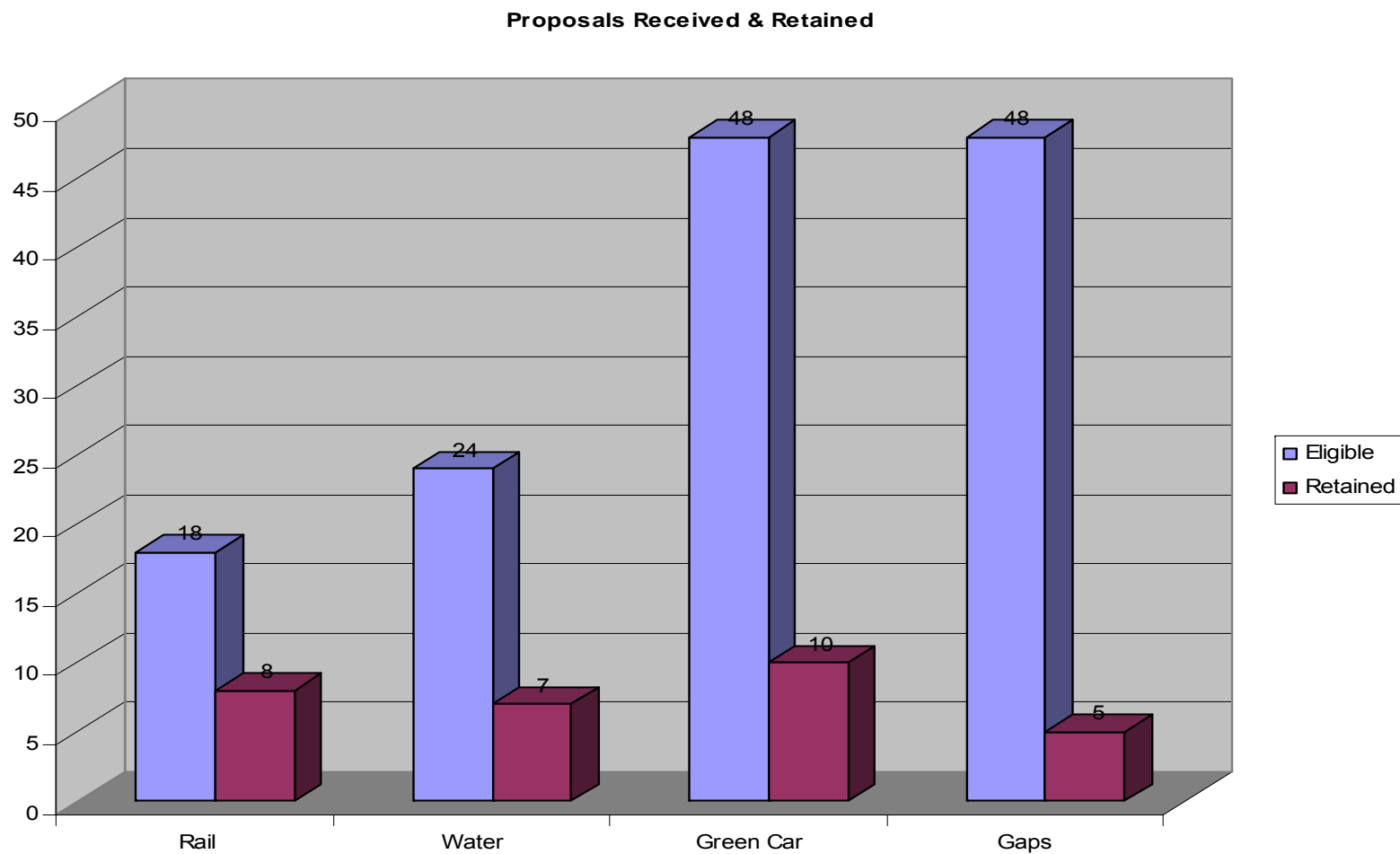
Group		Proposals				
		Submitted Elig Pls.	EC Grant Req.	Retained Pls.	EC Grant Rec	Success Rate No & (EC Rec grant)
1	Efficient railway services	18	54.3	8	23,4	44% (43%)
2	Waterborne Eco-innovation	24	65.4	7	26,4	29% (40%)
3	'European Green Car Initiative'	48	127.0	10	31,0	21% (24%)
4	Untapped research and filling gaps	48	111.3	5	10.9	10% (10%)
Total		138	358,8	30	91,7	22% (27%)

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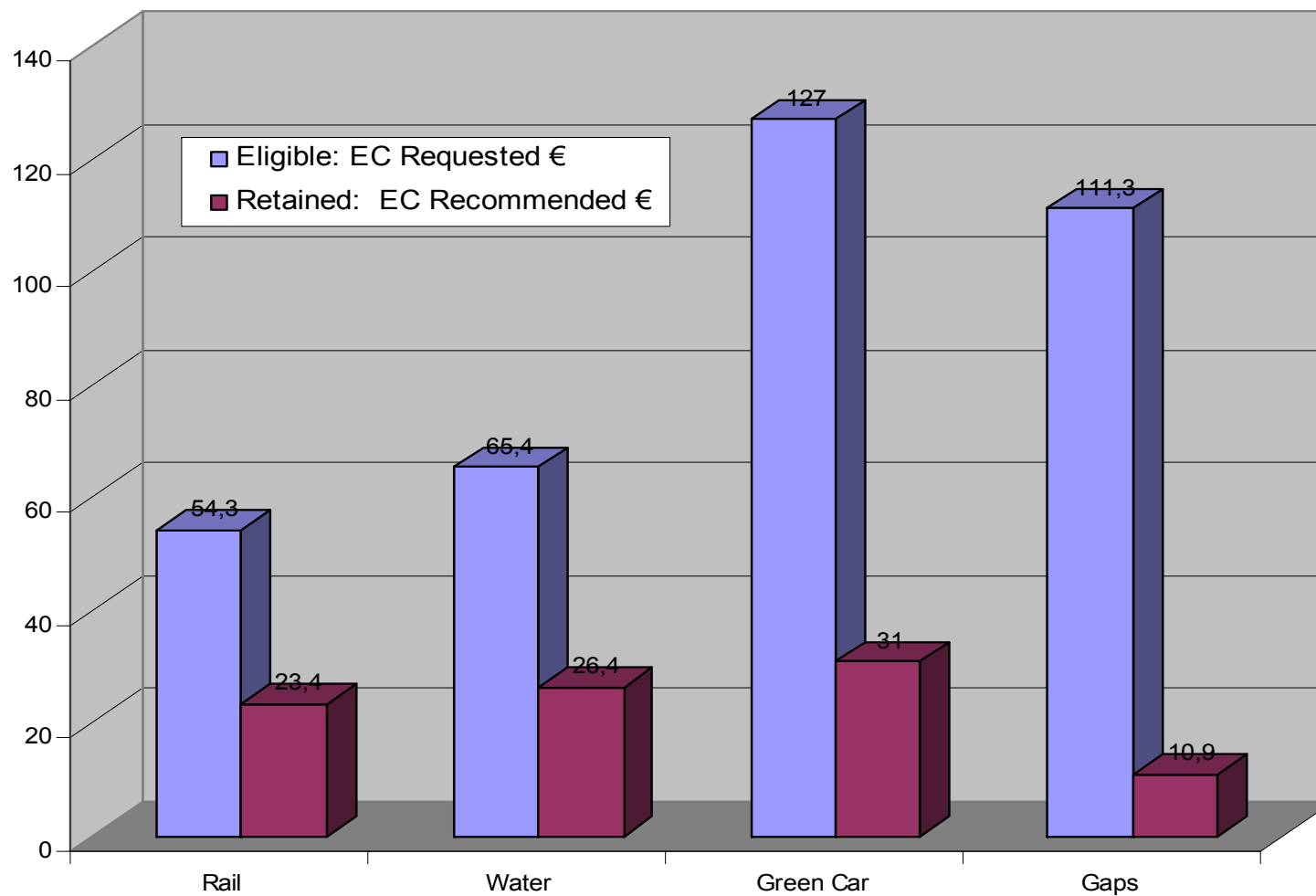
SEVENTH FRAMEWORK PROGRAMME



WP coverage by group of topics for received & retained proposals



Group of Topics: Requested and Recommended EC contribution



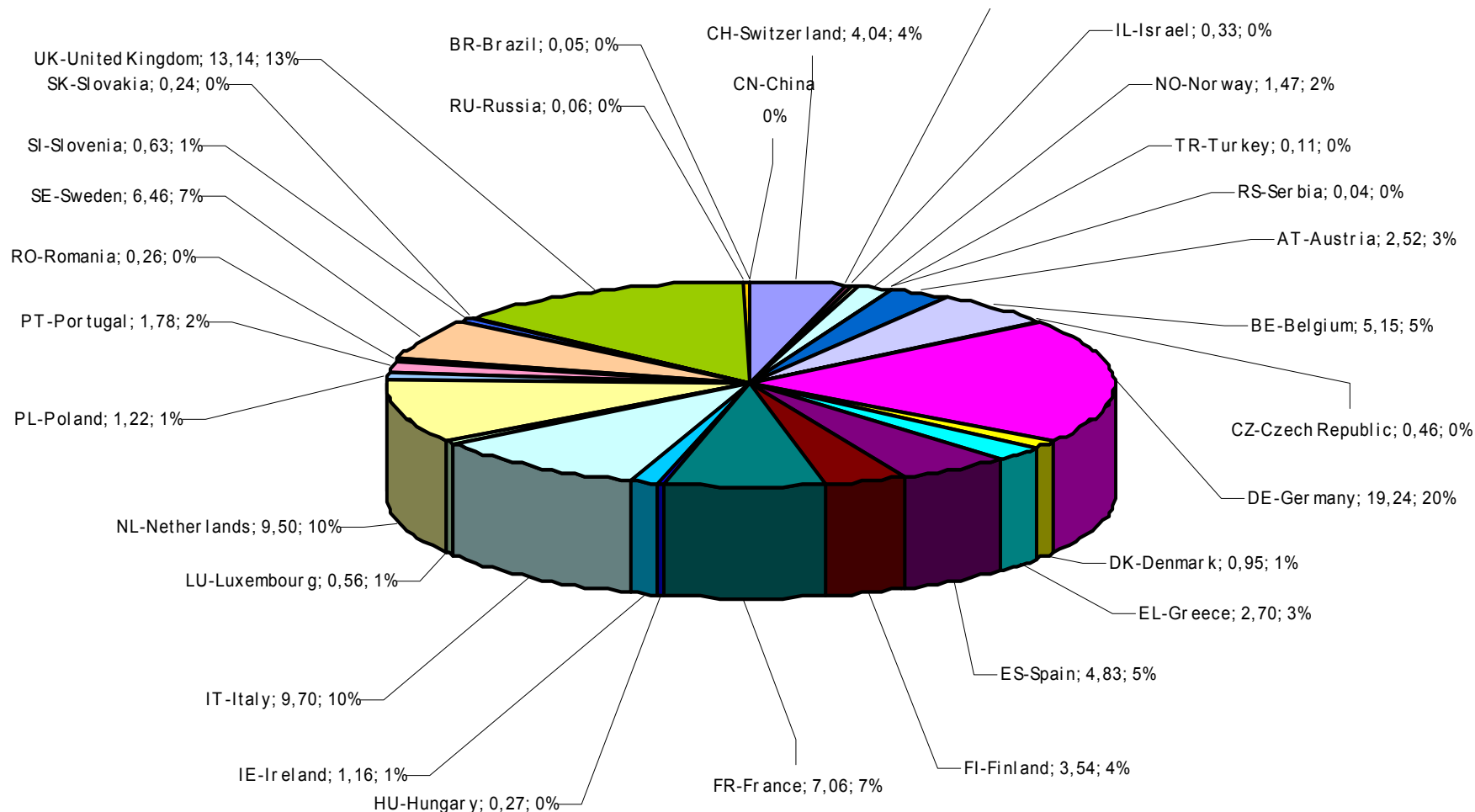
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General trends

- ▶ Participation by Country
- ▶ Participation By Type of Organisation
- ▶ SME participation by activity
- ▶ General conclusions



Distribution by country retained proposals: Total requested €97.9M



2007: EU12 3%, ICPC 1%, Assoc: 4%, 2008: EU12 2% ICPC 1%, Assoc 5% 2010 : EU12 4% ICPC >0.2%, Assoc 4%
2011: EU12 3%, ICPC 0,1% Assoc 6,5%

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Conclusions

- **Generally very good coverage of activities (84% of topics).**
 - ▶ Only Four topics not covered on main list.
 - ◆ SST.2011.1.1-4. Energy consumption reduction in urban rail systems
 - ◆ SST.2011.5.2-1. Strengthening the European maritime transport sector competitiveness.
 - ◆ SST.2011.5.2-4. Exploring and fostering international collaboration in the waterborne transport sector Success rates broadly similar between topic groups except "Gaps"
 - ◆ GC.SST.2011.7-2. Integrated thermal management
 - ▶ All uncovered topics are on reserve list except *"SST.2011.5.2-4. Exploring and fostering international collaboration in the waterborne transport sector"*
- **Average Success rate of 21%, 27% in financial terms.**
 - ▶ Gaps Over subscribed 10% success (*11% financial*)
 - ▶ Rail 44% proposal success rate compared to 29% for water. But in Budget terms similar to water at 43% for both groups

Conclusions cont.

- **SME participation:**
 - ▶ Remains very good at 25% continuous progress.
- **Organisation type:**
 - ▶ Strong industry participation (51%) with Higher education & research centres accounting for 39% of retained organisations.

The 2012 Transport Calls

- Date of publication: July 2011
- Deadline: December 2011
- Total indicative budget: more than 100M€ (all topics)
- Funding schemes:
 - ▶ CP: Collaborative Projects
- A draft call content might be published later in June, check Cordis.lu
- A launch event will be held on July 11/12

- **Thank you for your attention!**
- **Questions?**
 - ▶ Now or to
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