European Green Vehicle Initiative in Horizon 2020
Work programme 2015

DG RTD & DG CONNECT
European Green Cars Initiative PPP

115 projects, of which around 95 on electrification
Almost complete coverage of the EGCI roadmap

Member State participation

EC contribution in € million
Over 30 EGCI projects @ DG CONNECT (+ 4 CIP projects)

**Electric Powertrains**
- Source: ODIN

**Battery Management**
- Source: ESTRELIA

**Vehicle Dynamics**
- Source: E-VECTOORC

**E/E Architectures**
- Source: OpEneR

**Vehicle-to-Grid**
- Source: e-DASH

**Coordination & Support**
- Source: Smart EV-VC
EGVI Roadmap

- Resources
  - Integration
    - Modules
      - Systems
        - Vehicles
          - Integration
            - Infrastructure
              - 2-Wheelers
              - Passenger Cars & LDV
              - Trucks
              - Buses

- Additional focus on resources for green vehicles:
  - Alternative / lightweight materials
  - Alternative fuels and energies
  - Advanced materials, Equipment, Nano- / Microtechnologies
  - Advancement and adoption of resources for green vehicles
    - Processing, integrating advanced (lightweight) materials & technologies
    - Electrification & hybridization; Components for sensing & control;
    - Energy Storage, functional integration; design for manufacturing
    - Power electronics
    - Drivetrain for alternative / renewable fuels;
    - Reliability and robustness
    - Advanced ICE and ICE in context of electrification & hybridization
    - PT systems design, optimization, modularization and integration
    - PT integration, E/E architecture, thermal management, weight reduction
    - Simulation, prototyping, testing, recycling
    - Safety & security of data
    - Novel vehicle concepts; tailored trucks

- Integration
  - Interfaces and interaction to infrastructure outside vehicles,
    e.g. smart grid integration, IST for energy efficiency
  - Grid and road infrastructures
  - Data networks
  - Intermodal hubs
EGVI PPP in Work Programme 2015

**GV6:** Powertrain control for heavy-duty vehicles with optimised emissions

**GV.8:** Electric vehicles’ enhanced performance and integration into the transport system and the grid
Major challenges:

• Reducing real driving emissions and consumption of heavy duty road haulage

• These performances are closely intertwined and linked with the vehicle configuration and operating conditions.

• New means of flexible and global engine and emissions control can optimise the potential utilisation of individual systems.
Proposals should address the following actions:

- Optimise the control of powertrains taking into account specific transportation tasks.

- Exploit on board information provided by navigation systems (i.e. topography and slopes on the chosen route), emission sensors (On Board Diagnosis/On Board Measuring system), engine, after treatment, transmission, electronics and actuators state.

- Integrate with other data such as transport assignment (total weight, vehicle configuration, etc.) and real time traffic and weather conditions.

All performance to be validated through a demonstrator.
Expected impact:

• The resulting technology should deliver a global optimum for consumption (for both fuel, electric energy and other consumables related to emission control such as urea or ammonia) and noxious emissions on each mission, i.e.:
  
  • A reduction of fuel consumption of at least 20% on the same vehicle with conventional control should be demonstrated comparatively,

  • Emissions not exceeding Real Driving Emissions limits set by the established Euro VI procedures.

Funding scheme: Innovation Actions
Budget: Indicatively 5-7M€
Policy
Research and
Innovation
Topic GV.8-2015

Major challenges:
• Limited driving range – biggest deployment challenge; redesign of E&E architecture and components to achieve:
  • increased efficiency and range
  • transition to FEV
• BMS is fundamental for electrified vehicle performance, energy efficiency & range, safety, battery life & reliability.
• ICT is providing:
  • better range prediction & offering personalised options & services to the driver
  • supporting recharging or high-powered fast recharging coordinated with the local electric grid
Proposals should address one of the following domains, and could include interfaces between them:

- EV concepts featuring a complete revision of the E&E architecture to reduce complexity, the number of components & interconnections, while improving energy efficiency, functionality & modularity
  - May be supported by drive-by-wire, wireless communication, advanced energy storage
  - Should address safety, security, reliability & robustness, including EM compatibility
  - Should pursue a high degree of standardisation, covering the entire EV value chain
Proposals should address one of the following domains, and could include interfaces between them:

- **BMS research focused on a combination of:**
  - *Novel BMS designs with improved thermal management, power density and life time, safety & reliability*
  - *Improved modelling & simulation tools for BMS improvement*
  - *Standardisation of BMS components & interfaces*
  - *Test methodologies & procedures to evaluate the functional safety, reliability & lifetime of battery systems*
Policy Research and Innovation

Topic GV.8-2015

Proposals should address one of the following domains, and could include interfaces between them:

• Integration of the overall cycle of EV energy mgt into a comprehensive EV battery & ICT-based re-charging system mgt

• Digital support for EVs
  • service provision based on wireless / power line communication interfaces; roaming management, energy consumption & supply; cost aspects

• Interoperability of EVs with the communication infrastructure and electricity grid
  • regarding locally deployed smart-grid & smart-metering systems; investigating operational issues
Expected impact:

- **Improvements in the cost-performance ratio of EV**
- **Enhancements to vehicle range and/or weight, battery life and reliability without compromising on safety**
- **Standardised BMS components and interfaces**
- **Progress on ICT-based technologies for coordinated EV recharging.**
- **Improved attractiveness of EVs, achieved through seamless energy management (spanning the entire cycle from re-charging spot selection/reservation to plug-out after re-charging).**
- **Contributions to standardisation, strengthening competitiveness of the EU industry**

Funding schemes: Research and Innovation Actions
Total Budget: 20M€