

PROJECT

ECOGEN

Cooperative Advanced Driver Assistance System for Green Cars

Funding: European (7th RTD Framework Programme)

Duration: Sep 2010 - Feb 2013

Status: Complete with results

Total project cost: €3,157,978

EU contribution: €2,043,922



Call for proposal: FP7-2010-ICT-GC

[CORDIS RCN : 95257](#)

Background & policy context:

EcoGem aim and approach is to render the Full Electric Vehicle (FEV):

1. Capable of reaching the desired destinations through the most energy efficient routes possible
2. Making the best use of FEV context information and services - such as battery characteristics, location and availability of surrounding recharging points/stations, booking of recharging slots, etc. - while on the move

Objectives:

EcoGem claimed that the success and user acceptability of Fully Electric Vehicles (FEVs) was predominantly depend on their electrical energy consumption rate and the corresponding degree of autonomy that they could offer. EcoGem aimed at providing efficient ICT-based solutions to this great issue, by designing and developing a FEV-oriented highly-innovative Advanced Driver Assistance System (ADAS), equipped with suitable monitoring, learning, reasoning and management capabilities that would help increase the FEV's autonomy and energy efficiency.

EcoGem based its approach on rendering the FEV:

- capable of reaching the desired destinations through the most energy efficient routes possible;
- fully aware of surrounding recharging points/stations while on move.

To achieve its goals, EcoGem developed and employed novel techniques:

1. on-going learning-based traffic prediction;
2. optimised route planning;
3. interactive and inter-operative traffic, fleet and recharging management via V2V and V2I interfaces and communication.

EcoGem's key-objective was to infuse intelligence and learning functionalities to on-board systems, enabling autonomous as well as interactive learning through V2X interfacing. EcoGem vehicles should learn over time to predict (and thus avoid) congested routes, based on experience that they gather. This learning process eventually renders each EcoGem FEV capable of autonomously classifying routes according to their degree of congestion, enabling energy-driven route planning optimisation.

The EcoGem ADAS additionally worked to cater for the complete planning of the vehicle's recharging strategy. This optimisation process would typically include automated battery monitoring and various levels of pro-activeness, optimised scheduling according to several parameters (battery levels, energy consumption rate, desired destination, present location, daytime, traffic, user agenda, etc.), and real-time booking of recharging points.

Methodology:

Exploiting state-of-the-art technologies for V2I and V2V communication and cooperative mobility,

EcoGem architecture integrated both infrastructure-side and vehicle-side systems and services.

Based on V2I and V2V exchanges of information, the EcoGem ADAS catered for energy-efficient vehicle routing based on contextual travel and traffic condition information, as well as for the complete planning of the vehicle's recharging strategy. This optimisation process would typically include automated battery monitoring and various levels of pro-activeness, optimised scheduling according to several parameters (battery levels, energy consumption rate, desired destination, present location, daytime, traffic, user agenda, etc.), and real-time booking of recharging points.

Overall, three main ICT development areas were addressed within EcoGem:

- In-vehicles services
- Central platform services
- Bidirectional communications:
 - V2V interactions
 - V2I/I2V interactions

Parent Programmes:

[FP7-ICT - Information and Communication Technologies](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Temsa Global Sanayi Ve Ticaret A.s.

Address:

Mersin Yolu Uzeri 10.km Seyhan
1323 Adana
Turkey

EU Contribution: €113,328

Partner Organisations:

Temsa Arastirma Gelistirme Ve Teknoloji A.s.

Address:

Tubitak Mam Teknoloji Serbest Bolgesi
41470 Kocaeli
Turkey

EU Contribution: €0

Instytut Transportu Samochodowego

Address:

Jagiellonska
03N/A301 Warsaw
Poland

Organisation Website:

<http://www.its.home.pl/nsite/>

EU Contribution: €66,600

Hi Iberia Ingenieria Y Proyectos SI

Address:

Bolivia
28016 Madrid
Spain

Organisation Website:

<http://www.hi-iberia.es>

EU Contribution: €192,525

Fundacion Tecnalía Research & Innovation**Address:**

PARQUE CIENTIFICO Y TECNOLOGICO DE GIPUZKOA PASEO MIKELETEGI 2
20009 DONOSTIA/SAN SEBASTIAN (GIPUZKOA)
Spain

Organisation Website:

<http://www.tecnalia.com>

EU Contribution: €199,575

Cosmote Kinites Tilepikoinonies Ae**Address:**

Kifissias 99
15124 Athens
Greece

EU Contribution: €102,555

Ptv Planung Transport Verkehr Ag**Address:**

Stumpfstrasse 1
76131 KARLSRUHE
Germany

Organisation Website:

<http://www.ptv.de>

EU Contribution: €243,400

Pininfarina Spa**Address:**

Via Bruno Buozzi
10100 Turin
Italy

Organisation Website:

<http://www.pininfarina.it>

EU Contribution: €175,748

Softeco Sismat S.p.a.**Address:**

VIA DE MARINI 1
16149 GENOVA
Italy

Organisation Website:

<http://www.softeco.it>

EU Contribution: €306,786

Here Global B.v.

Address:

De Run
5503 Veldhoven
Netherlands

EU Contribution: €110,740

European Virtual Engineering Fundazioa*fundacion European Virtual Engineering**Address:**

AVENIDA DE LOS HUETOS
E-01010 VITORIA-GASTEIZ
Spain

EU Contribution: €0

Institute Of Communication And Computer Systems**Address:**

Patission
10682 Athens
Greece

Organisation Website:

<http://www.iccs.gr>

EU Contribution: €208,665

University Of Bradford**Address:**

Richmond Road
Bradford
BD7 1DP
United Kingdom

EU Contribution: €324,000

Technologies:

Advanced driver assistance systems
ADAS learning and harm prevention platforms

Development phase: Implementation

Key Results:

The project lasted 30 months. In the first year of the project, which corresponds to 01.09.2010-31.08.2011, Work Packages WP2 and WP3 were completed, while Work Packages WP1 and WP6 were still worked on.

Work Package 1 was about administrative and technical management of the project and lasted to the projects end. In this work package, the Project Handbook was prepared (deliverable D1.1), Kick-Off meeting were done, consortium agreement were negotiated, and project repository went online.

In Work Package WP2 the state of the art assessment was made, six use case scenarios were created (deliverable D2.1), route planning and vehicle recharging optimization on-board ADAS requirements, traffic and recharging management platform requirements, protocol and interfaces requirements, simulation platform requirements, safety and usability requirements and security and privacy requirements were set (deliverable D2.2). System functional architecture was built (deliverable D2.3).

In Work Package WP3, a scalability and performance analysis of EcoGem Applications was made (deliverable D3.1), specifications for the requirements were defined (deliverable D3.2), EcoGem system specifications and technical design was prepared (deliverable D3.3). The prototype system and trial specifications were set (deliverable D3.4).

In Work Package WP6 for the dissemination objective, the project leaflet was prepared, project website was built, EcoGem's articles were accepted and disseminated through IEEE Magazine for Vehicular Technology, Advanced Microsystems for Automotive Applications 2011, 8th ITS European Congress-Lyon, IEEE Intelligent Vehicles Symposium 2011, Transport Research Arena 2012-Athens, 18th World Congress on Intelligent Transport Systems, Orlando. EcoGem supports the known communications standards such as 3GPP GPRS/UMTS for I2V/V2I communication, IEEE 802.11 standards (a/b/g/p) for V2V communication, and optionally 802.16 standards family (d and especially e or m in future).

Strategy targets

Innovating for the future: technology and behaviour

- Promoting more sustainable development

Documents:

 [ECOGEN Flyer \(Other relevant documents\)](#)

Cooperative, connected and automated transport, Transport

STRIA Roadmaps: electrification

Transport mode: Road transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Digitalisation

Geo-spatial type: Other