The EU Framework Programme for Research and Innovation

HORIZON 2020

Smart, green and integrated Transport

Work Programme 2016-2017

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DG RTD, European Commission
A3PS, Vienna 9-10 November 2015

Research and Innovation

The EU Framework Programme for Research and Innovation

HORIZON 2020

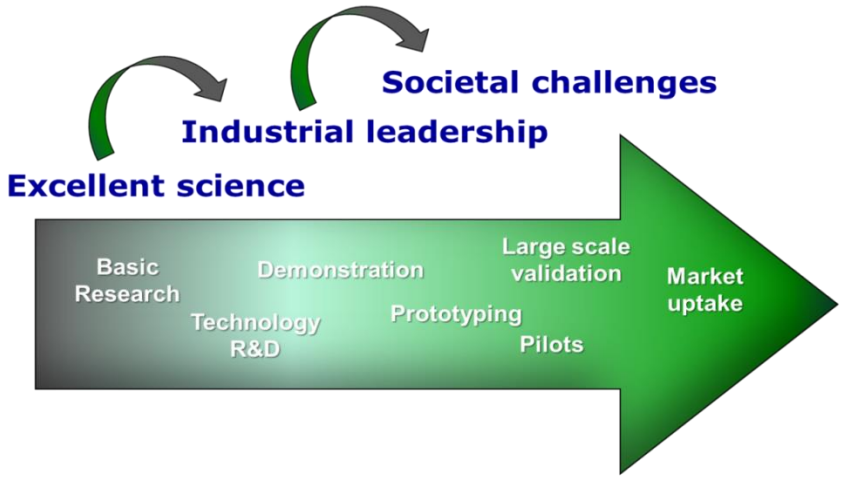
- ✓ **Overview WP2016-2017**
- ✓ **Automated Road Transport**
- ✓ **Green Vehicles**
- ✓ **Other Actions (Prize, SME, FTI)**

Research and Innovation

Horizon 2020

- EU Framework Programme for Research and Innovation
- € 79 billion from 2014 to 2020
- Biggest multinational research programme in the world

- Covers the full innovation chain
- Funds research in all areas of science and innovation
  - Excellent Science
  - Competitive Industries
  - Tackling global societal challenges



- 1st WP
- 2nd WP
- 3rd WP

2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020

Work Programme 2016-2017

Transport Work Programme

Calls for proposals:

1) Mobility for Growth
2) Automated Road Transport *New*
3) European Green Vehicles Initiative

Other activities

- Blue Growth (SC2/Food)
- ELENA Facility (SC3/Energy)
- SME Instrument
- Fast Track to Innovation
- LEIT/NMBP, ICT, Space; SC/Energy, Security, Climate; Smart Cities

Plus other actions (public procurements, …)

Complementarities with Clean Sky 2, SESAR, Shift2Rail, FCH2

2016-17 calls: key dates

	Date	Calls / topics
2015	**15 October**	**Opening of 2016 calls**
2016		**Closing**
	20 January	**Two-stage** topics: **1st stage** proposals
	26 January	**Single-stage** topics
	29 September	**Two-stage** topics: **2nd stage** proposals
2016		**Opening of 2017 calls**
	20 September	Calls **Mobility for Growth** & **Autom. Road Transport**
	4 October	Call **Green Vehicles**
2017		**Closing**
	26 January	**Two-stage** topics: **1st stage** proposals
	1 February	**Single-stage** topics
	27 September	**Two-stage** topics: **2nd stage** proposals - call ART
	19 October	**Two-stage** topics: **2nd stage** proposals - call MG

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Research and Innovation

"Automated Road Transport"

(H2020-ART-2016-17)

- Key priority in the H2020 Transport Research programme
- Indicative budget: € 114 Mio
- Publication date: 14 October
- Priorities of this new call are fully in line with the Automated Driving Roadmap of ERTRAC
- Focus of the Call
  - **Support the short term introduction of automated driving systems for passenger cars, trucks and urban transport**
  - **"Large-scale Field Operational Tests" to test technologies in complex traffic and driving conditions**

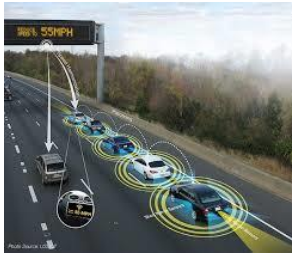
"Automated Road Transport"

(H2020-ART-2016-17)

Detect vehicle location and environment

Vehicle-driver interface

User and social acceptance



Connectivity for advanced level of automation

R&I priorities

Safe AD systems in complex traffic situations

Automation Pilots

Road infrastructure

"Automated Road Transport" Twinning

- **EC and US DOT encourage twinning to exchange knowledge and experience and exploit synergies**
- **Twinning activities are on voluntary basis**
- **Full flexibility for defining twinning activities**
- **Examples for twinning activities:** exchanges of information, data, visits, methodologies, researchers, results, joint workshops, publications etc.
- **In the proposal phase:**
  - 1st stage proposal: broadly outline planned areas for twinning with US organisations
  - 2nd stage proposal: specify the workpackages and tasks for "twinning" activities with US organisations
  - No need to specify US organisations in the proposal
- **FAQ will be available**
- **Twinning is foreseen only for a selected number of topics**

Automated Road Transport: topics and budget – *Total EU contribution: EUR 114 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
ART-01	**ICT infrastructure to enable the transition towards road transport automation**	IA	2		50
ART-03	**Multi-Brand platooning in real traffic conditions**	IA	2		
ART-07	**Full-scale demonstration of urban road transport automation**	IA	2		
ART-02	**Automation pilots for passenger cars**	IA	2	48	
ART-04	**Safety and end-user acceptance aspects of road automation in the transition period**	RIA	2		
ART-05	**Road infrastructure to support the transition to automation and the coexistence of conventional and automated vehicles on the same network**	RIA	2	13	
ART-06	**Coordination of activities in support of road automation**	CSA	1	3	

CSA = Coordination and Support Action
IA = Innovation Action; RIA = Research and Innovation Action

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Research and Innovation

"Green Vehicles"
(H2020-GV-2016-2017)

Objectives

- **Boost competitiveness and growth**
- **Clean transport, de-carbonise society**

- Promote energy efficiency, use of non conventional energies (electricity, CNG, LNG, renewables), alternative fuels
- Reduce pollution, noise, impacts on health
- Improve engines, power-trains, vehicle architecture, manufacturing processes

'European Green Vehicles Initiative' (EGVI) WP 2016-2017

- EGVI includes research, technological developments, innovation and demonstration in support of **improvements in energy efficiency** and the use of **new types of non-conventional energies** in road transport (such as electricity, CNG and LNG, renewable and tailored fuels), including:
  - advanced power-train technologies
  - new vehicle architectures
  - weight reduction
  - improved aerodynamics and rolling resistance
  - component development for alternative fuel vehicles
- **Interfaces between vehicles and recharging infrastructure** with particular attention to standardisation issues
- **Multi-sectorial research** involving other areas such as Energy and Environment coupled with research on new materials, advanced production and ICT will be encouraged
- A topic on **materials affordable weight reduction** (vehicles and components) included in "Nanotechnologies, Advanced materials, Biotechnology and Advanced Manufacturing and Processing"

Green Vehicles [1/2]

Total EU contribution: EUR 206,5 Mio

Topic	Title	Action type	Stages	Budget (EUR Mio) 2016
GV-02	**Technologies for low emission light duty powertrain**	RIA	1	65
GV-03	**System and cost optimised hybridisation of road vehicles**	IA	1	
GV-11	**Stimulating European research and development for the implementation of future road transport technologies**	CSA	1	3,5
GV-12	**ERA-NET Co-fund on electromobility**	ERA-NET	1	10
NMBP-08	**Affordable weight reduction of high-volume vehicles and components**	RIA	1	16

CSA = Coordination and Support Action
RIA = Research and Innovation Action
IA = Innovation Action
ERA-NET = ERA-NET Cofund Action

Green Vehicles [2/2]

Total EU contribution: EUR 206,5 Mio

Topic	Title	Action type	Stages	Budget (EUR Mio) 2017
GV-01	Optimisation of heavy duty vehicles for alternative fuels use	IA	1	128
GV-04	Next generation electric drivetrains for fully electric vehicles, focussing on high efficiency and low cost	RIA	1	
GV-05	Electric vehicle user-centric design for optimised energy efficiency	RIA	1	
GV-06	Physical integration of hybrid and electric vehicles batteries at pack level aiming at increased energy density and efficiency	IA	1	
GV-07	Multi-level modelling and testing of electric vehicles and their components	RIA	1	
GV-08	Electrified urban commercial vehicles integration with fast charging infrastructure	IA	1	
GV-09	Aerodynamic and flexible trucks	IA	1	
GV-10	Demonstration (pilots) for integration of electrified L-category vehicles in the urban transport system	IA	1	

IA = Innovation Action; RIA = Research and Innovation Action

Some statistics on EGVI (H2020 – call 2014)

- ✓ **The launch in H2020 of the EGVI cPPP contributed to the submission of a large number of competitive projects.**

- ✓ There has been one EGVI call in H2020 in 2014 where **99 proposals** have been submitted and **17 projects** have been selected for funding, receiving a **total EU contribution of € 148.5 million.**

- ✓ They include **265 participants,** with industrial involvement of 54%, including **53 SMEs.**

- ✓ **In 2015 two more topics** will be opened for proposals under the **GV-2015 call**, with an indicative budget of €30 million. The deadline for proposal submission is 15th October 2015:
  - Powertrain control for heavy-duty vehicles with optimised emissions – **GV6**
  - Electric vehicles' enhanced performance and integration into the transport system and the grid – **GV8**

EGVI
European Green Vehicles Initiative

ENLIGHT

www.seam-cluster.eu & www.project-enlight.eu

Mission:

Development of highly innovative lightweight material technologies for structural parts of electric vehicles

Focus:

- highly innovative lightweight / low embedded CO_2 materials such as thermoplastics or bio-based materials,
- Manufacturing and joining capabilities for affordable medium-volume lightweight EVs.
- Design capabilities for affordable medium-volume lightweight EVs

Coordinator:
Fraunhofer LBF
Total costs: 10,9M€
EC contribution: 7,1M€
Start date: 1/10/2012
Duration: 48 months

Research Topics and results:

- Conceptual lightweight design of defined modules of an advanced electric vehicle architecture with respect to weight and CO2 balance over life-time
- Development of highly advanced materials to a stage that they are applicable at least in medium volume production; considered are thermoplastic and fibre reinforced composites, advanced hybrid (Al/CFRP) and sandwich materials, bio-materials
- Manufacturing processes for these materials for medium-scale production

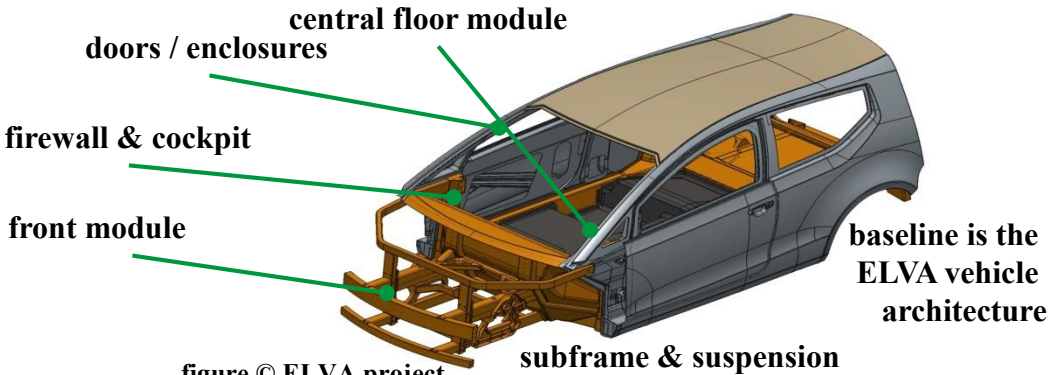


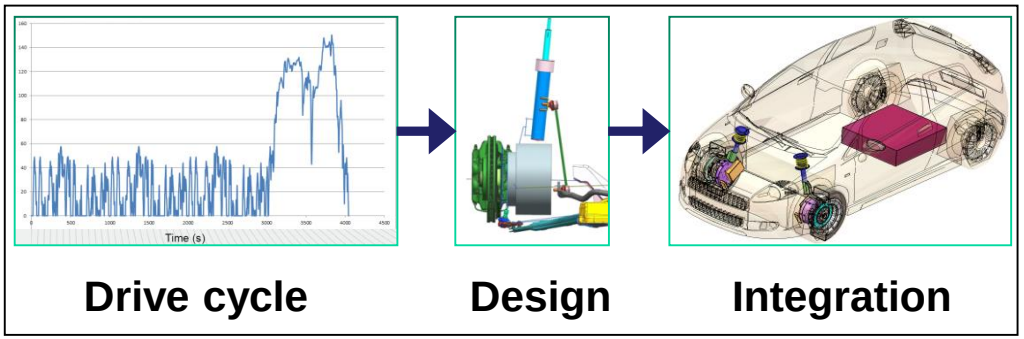
figure © ELVA project

Mission:

Eco-design and validation of a new generation in-Wheel motor Concept for Electric Vehicles

Focus:

- New GKN "in wheel motor" solution for "B segment" electric vehicles
- Robustness and safety, with high power density for ICE-equivalent performance (52kW continuous operation, 100kW peak)
- Compatible with existing platforms with minimum changes



Research Topics and results:

- Functional requirement definition:
  - Torque- Speed characteristic for high performance & drivability
  - Definition of vehicle dynamics targets
- Integration on a McPherson suspension type:
  - Research in highly integrated topologies
  - Thermo mechanical constraints definition
- Subcomponents fully developed and tested
- Final prototype assembled and ready for testing on validation vehicle

Coordinator: Tecnalia
Total budget: 4,8M€
EC contribution: 2,9M€
Start date: 1/9/2012
Duration: 36 months

http://www.eunice-project.eu/

European Commission

FABRIC

1. Orienting future activities → 2. Relevant Issues and evidence of BENEFITS

Technologies
- -Dynamic Charging
- -Efficiency Improvement
- -ICT Solutions
- -Health & Safety
- -Technical Standards
- -Privacy & Data Security

Industry
- -Vehicle Architecture
- -Energy Storage (battery size)
- -Power electronics
- -Ergonomics & semi-automated driving
- -Life Cycle Assessment
- -Life Cycle Costs

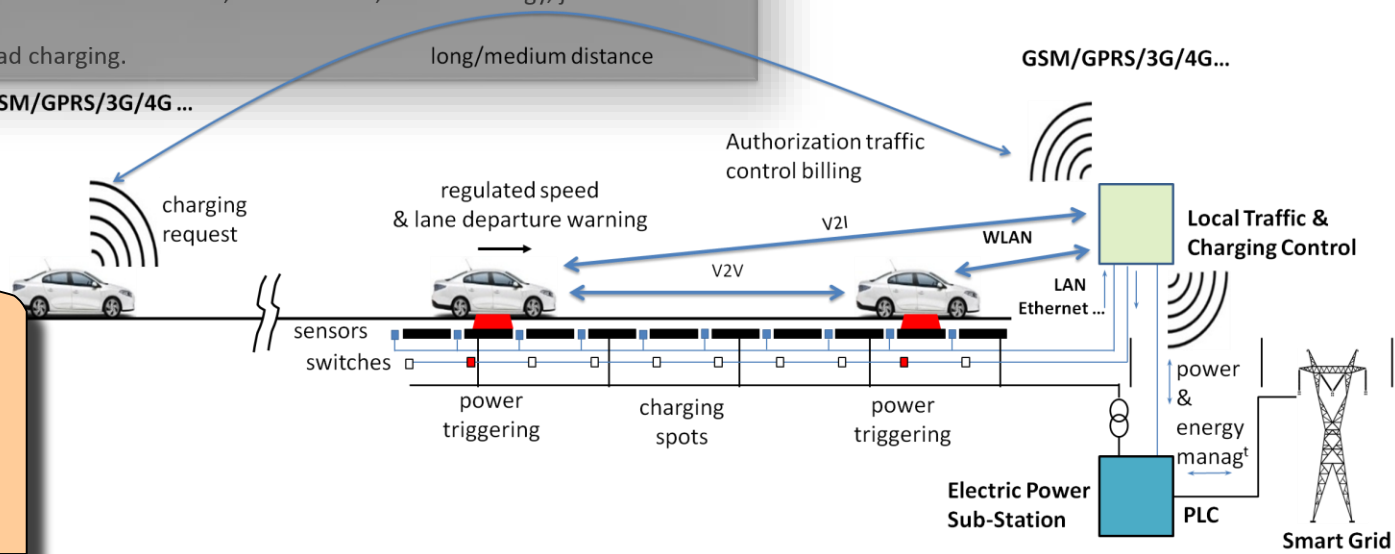
Infrastructure & Social Impact
- -Grid interaction
- -Pavement infrastructure
- -RES integration
- -Costs & Investment
- -Operation & Maintenance
- -Customer acceptance
- -Policy & Stakeholder awareness
- -Collaboration & Partnership

3. Technological GAPS

Energy Optimisation
Environmental Benefits
Smart Cities
Social (End User)
Economic Benefit
Safety & Health
Sandardisation
Harmonisation

FABRIC Consortium & External Reference Group
-National and EU projects experience and Reinforcement of all value chain levels;
-Cooperation and coordination with projects related with NMP, Environment, ICT and Energy, joint with European Green Car initiative advisory;
-Provide EU common positioning in on-road charging.

On road charging feasibiity study, underpins recently announced TRL study for UK test road



Coordinator: ICCT
Total budget: 4,8M€
EC contribution: 2,9M€
Start date: 1/9/2014
Duration: 48 months

Funded project 2015 (H2020 – call 2014)

ECOCHAMPS – European COmpetitiveness in Commercial Hybrid and AutoMotive PowertrainS

FUNDED

From 2015-05-01 **to** 2018-05-01, ongoing project

Total cost: 28M€; **EU contribution:** 21M€

GV-4-2014 - Hybrid light and heavy duty vehicles

Objective: The project will develop efficient, compact, low weight, robust and cost effective hybrid powertrains for both passenger cars and commercial vehicles (buses, medium and heavy duty trucks) with increased functionality, improved performance, comfort, safety and emissions below Euro 6 or VI, all proven under real driving conditions

26 partners representing the whole European automotive value chain, with 5 OEMs (FCA/FPT, IVECO, Renault, MAN, Daimler), 7 suppliers (including Bosch, GKN, ZF, Magna), 7 large research centres (such as Ricardo, AVL, FEV, Fraunhofer, JRC), SMEs and universities

Funded project 2015 (H2020 – call 2014)

ECOCHAMPS – European COmpetitiveness in Commercial Hybrid and AutoMotive PowertrainS

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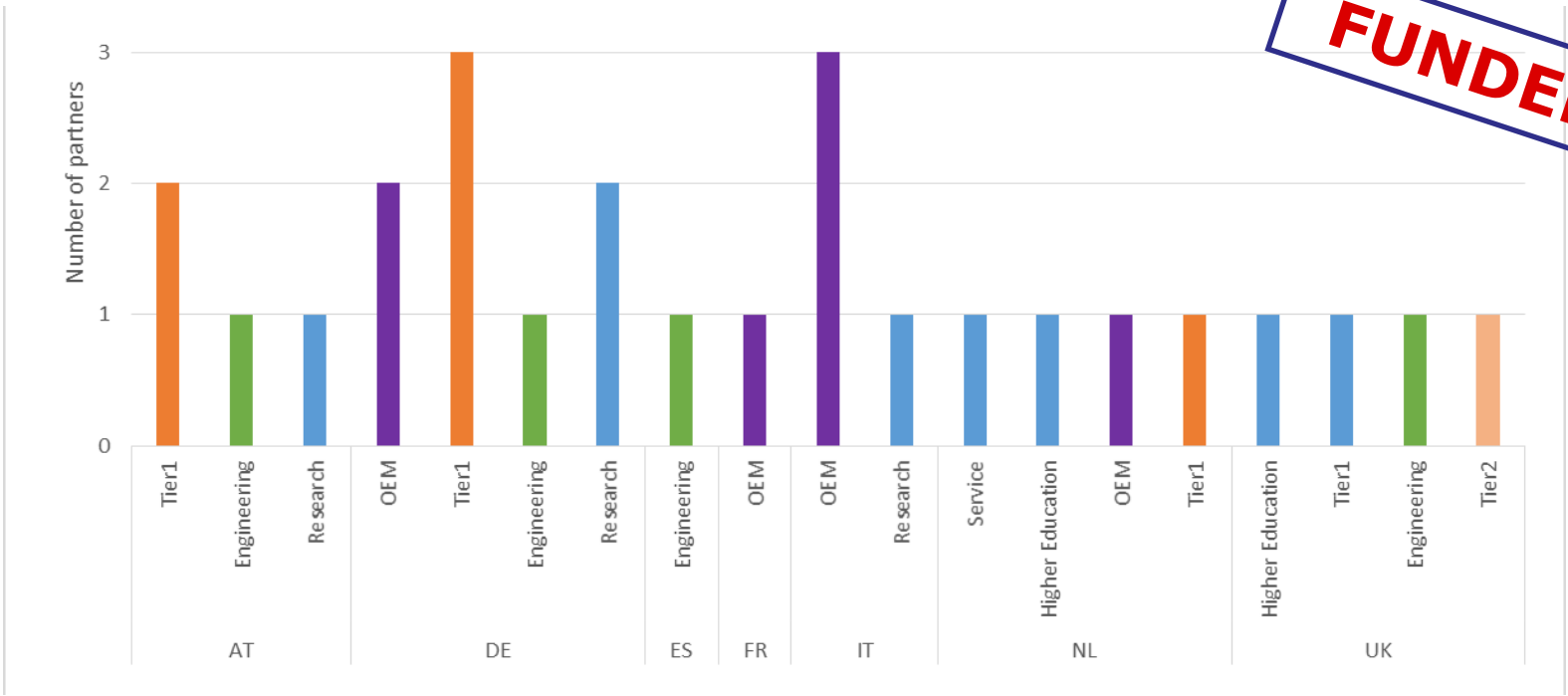

Partners: DAF (NL), CRF (IT), DAIMLER (DE), FPT (IT) IVECO (IT), MAN (DE), RENAULT (FR), BOSCH (DE), ECS (AT), GKN (DE), GEVEKE (NL), JMBS (UK), MSBS (AT), ZF (DE), ETL (UK), AVL (AT), FEV (DE), RIC (UK), TECNALIA (ES), UNR (NL), FhG (DE), IKA (DE), JRC (BE), VIF (AT), QMUL (UK), TUe (NL), HYDRO (UK)

Funded project 2015 (H2020 – call 2014)

FIVEVB – Five Volt Lithium Ion Batteries with Silicon Anodes produced for Next Generation Electric Vehicles

FUNDED

From 2015-05-01 **to** 2018-05-01, ongoing project

Total cost: € 6M€; **EU contribution:** € 5,7M€

GV-1-2014 - Next generation of competitive Li-ion batteries to meet customer expectations

Objective: The FiveVB project will develop a new cell technology based on innovative materials such as high capacity anodes, high voltage cathodes and stable, safe and environmentally friendly electrolytes

The integrated and trans-disciplinary approach adopted by the project consortium of 10 partners all along the research and value chain enables fast-track access to relevant expertise. It includes an OEM (BMW), a Tier 1 (Bosch), chemical companies (3M, Arkema, Umicore), research centers (AVL, ZFS, JRC, Das Virtuelle Fahrzeug) and universities (VUB)

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Research and Innovation

Horizon prize for the cleanest engine

Rationale

- Air quality is not improving fast enough, particularly as far as NO2 is concerned
- Diesel engines are the main culprit
- Regulation for cars and vans imposes performance on test cycle, but real emissions are much worse
- Real driving emissions regulations are coming, but will take time to have an impact
- Initial regulations will be relatively lenient
- To improve air quality and protect citizens' health:
  - **Something needs to be done for the existing fleet;**
  - **Engines with really clean exhausts might be needed in the long term, even if electrification will grow (for hybrids, for instance).**

Horizon prize for the cleanest engine

Challenge

- Helping the development of technologies to reduce emissions of pollutants in real driving conditions

Scope

- Two prizes addressing (A) the existing fleet (retrofittable technology) and (B) future vehicles

Expected impact

- Reduce noxious emissions

Indicative budget: EUR 1,5 (A) + 3,5 (B) Mio

Target audience: individuals, SMEs, research centres, universities, suppliers of components, car manufacturers

The SME Instrument and the Fast Track to Innovation

Common features

- Provide the **"last-push" to innovative solutions** by supporting the introduction into the market of promising technological or non-technological innovations
- Stimulate private sector investment in R&I
- **Continuously Open call**: submissions any time – several cut-off dates per year
- **EU-dimension**: market relevance and commercial strategy
- Innovation action type of projects: **70% funding**
- Central implementation → **EASME**

The SME Instrument

The 3 Project Phases

Phase 1 – Proof of concept: technical feasibility and market potential of new ideas

- € 50 000 in EU funding – lump sum
- Initial 10 page business proposal to be drafted
- 3-6 months in duration

Phase 2 – Innovation projects: focus on demonstration/pilot and market replication

- Between €0.5 and €2.5 million in EU funding
- Business plan – 30 pages
- 1-2 years in duration

Phase 3 – Support measures

- No direct funding
- Extensive support: Business Coaching, Networking opportunity, Facilitate access to risk finance, Investor readiness, International trade fairs

Examples of SME Phase 2 grants: Road/Urban

- Knowledge Development for POF SL (ES) – 1,3 M€: **Rapid Data Communication Network for Connected Cars**
- Muses SAS (FR) - 1,7 M€ grant: **New electric vehicle for urban logistic**
- ROBOSOFT Driverless Solutions (FR) – 1,6 M€ grant: **Intelligence solutions for automated road transport systems**
- Amminex Emissions Technology A/S (DK) -1,9 M€ grant: **An opportunity to meet legal requirements in real life driving conditions for City busses**
- ParkTAG GmbH (DE) – 1,4 M€ grant: **Social and universal technology for searching local parking space**

The Fast Track to Innovation Pilot scheme – FTI Pilot

Specific features

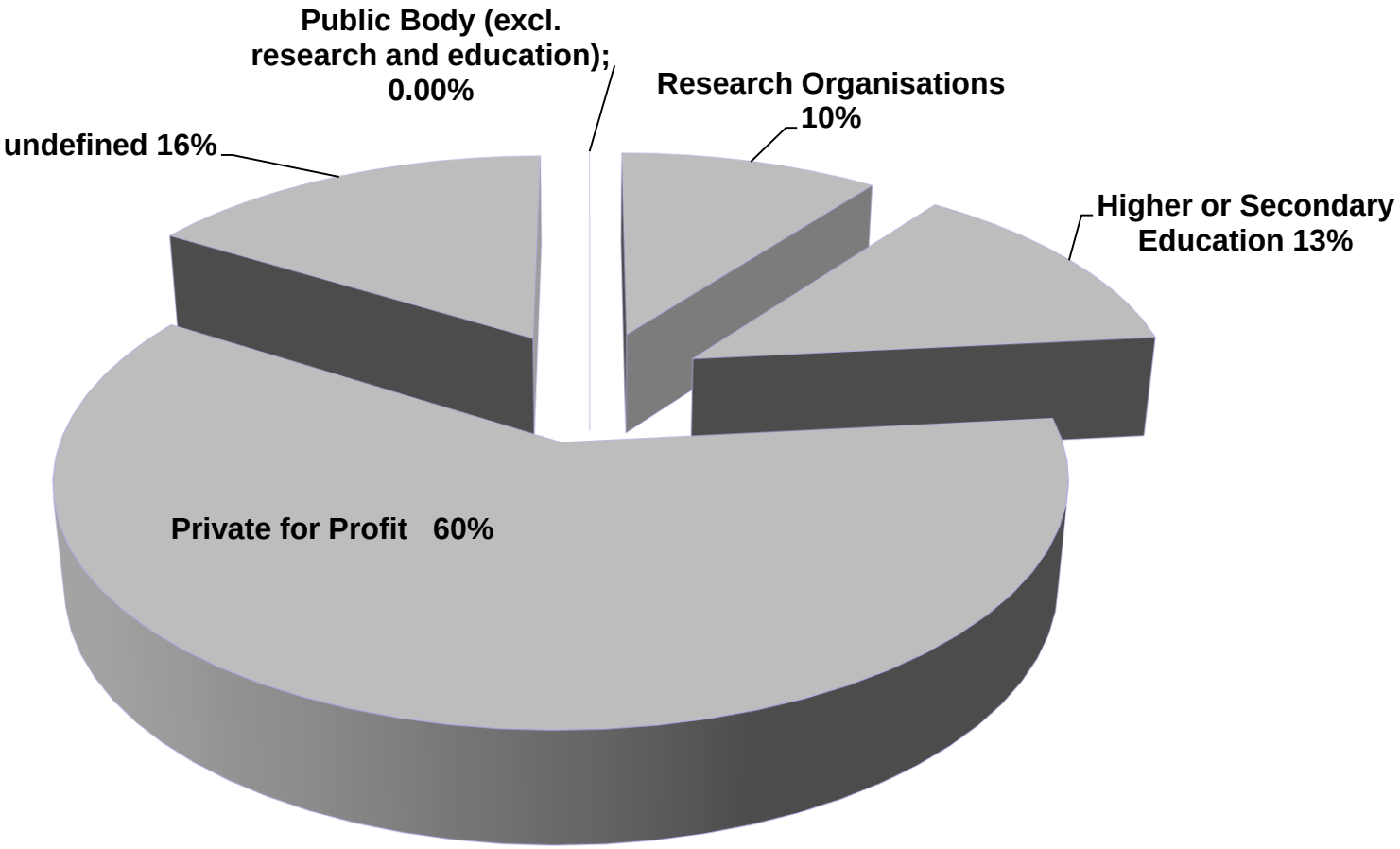
- **Bottom-up** logic covering all priorities of H2020 Industrial Leadership and Societal Challenges
- Common budget: **€ 100 mio and € 100 mio** in 2015 and 2016 (no Transport dedicated budget)
- Grant up to **€ 3 mio** per project
- Call opening: **6/1/2015**
- **Next cut-off dates**: 1 December 2015, 15 March 2016, 1 June 2016, 25 October 2016

The Fast Track to Innovation Pilot scheme – FTI Pilot

Specific features

- All types of participants: **min. 3 - max. 5 partners**
- **Industry involvement is mandatory**
  - either at least 60% of the overall budget of the proposal must be allocated to consortium partner(s) from industry
  - or the minimum number of industry participants must be 2 in a consortium of 3 or 4 partners, and 3 in a consortium of 5 partners
- FTI proposals are expected to have a **readiness level of 6** out of 9, i.e: technology demonstrated in relevant (industrial) environment **(TRL 6)**
- **Time-to-market: 36 months** or less
- Proposals shall include a **business plan** (market development strategy)

Type of organisations in selected proposals – FTI Pilot



Examples of FTI grants: Road/Urban

BeLEADFREE - High Strength Bearing for Large-Bore LEAD FREE Engines **€ 2.96 mio**	- Daido Metal Co. Ltd - ELS - IK4 TEKNIKER - Coventry University	- UK - BE - ES - UK
CARIM - Commercialization of a full carbon wheel manufactured with an automated high-volume process for the automotive market **€ 1.93 mio**	- FRAUNHOFER - RI-BA Composites - S.R.L. - APPTECH Srl - ALPEX Technologies GMBH	- DE - IT - IT - AT
DISRUPT - Development of an innovative and safe ultralight two- seater turbine helicopter **€ 2.92 mill**	- Curti Cosruzioni Meccaniche S.P.A. - PRVNI BRNENSKA STROJIRNA VELKA BITES A.S - Junkers Profly GmbH	- IT - CZ - DE
eSHaRk - eco-friendly Ship Hull film system with fouling Release and fuel saving properties € 2.4 mio	- PPG COATINGS EUROPE BV - MACtac - HSVA - ND Coatings GmbH - VertiBlast	- FR - BE - DE - DE - NL
GEM - in-wheel motor **€ 1.99 mio**	- GEM MOTORS - DOMEL D.O.O. - TISKANA VEZJA LUZNAR d.o.o. - CITY MOTION - Fraunhofer	- SL - SL - SL - FR - DE
LICORNE - LIssage de COrdons Robotisé Novateur Expert **€ 2.1 mio**	- PEUGEOT CITROEN AUTOMOBILES S.A. - EFTEC Engineering GmbH - CLEMESSY SA - CTAG - CNRS	- FR - DE - FR - ES - FR

InnoVFin

EU Finance for Innovators

The new generation of Horizon 2020 financial instruments

Horizon 2020 Access to Risk Finance - Basics

1) **What support is on offer?**

- Risk-sharing in the form of loans and guarantees

- Risk finance in the form of equity

2) **For who or what?**

- RDI-driven/ innovative SMEs & small midcaps

- Ambitious RDI projects carried out by a variety of recipients (companies, stand-alone projects etc.)

3) **To serve which purpose?**

- Stimulate more investment in research and innovation, notably by the private sector

- No market distortion: intervention only to address financing gaps in the R&D&I delivery chain (notably due to high risk), and as such help translate R&D results to the market (/innovation)

(*))

InnovFin - Key Figures

- **InnovFin builds on the success of the Risk-Sharing Finance Facility (RSFF): 114 R&I projects to the tune of EUR 11.3bn and loan guarantees worth over EUR 1.4bn between 2007-2013**
- **Until 2020, EU will contribute close to EUR 3bn as a risk buffer to InnovFin. EIB Group commits the same amount**
- **This will result in total debt financing of > EUR 24bn, of which > EUR 5.5bn to SMEs and small MidCaps**
- **The overall economic impact in terms of investment in Research & Innovation in Europe over the next 7 years will EUR 48bn**
- **Expected number of transactions: ca. 300 (of which ca. 110 direct operations with midcaps)**

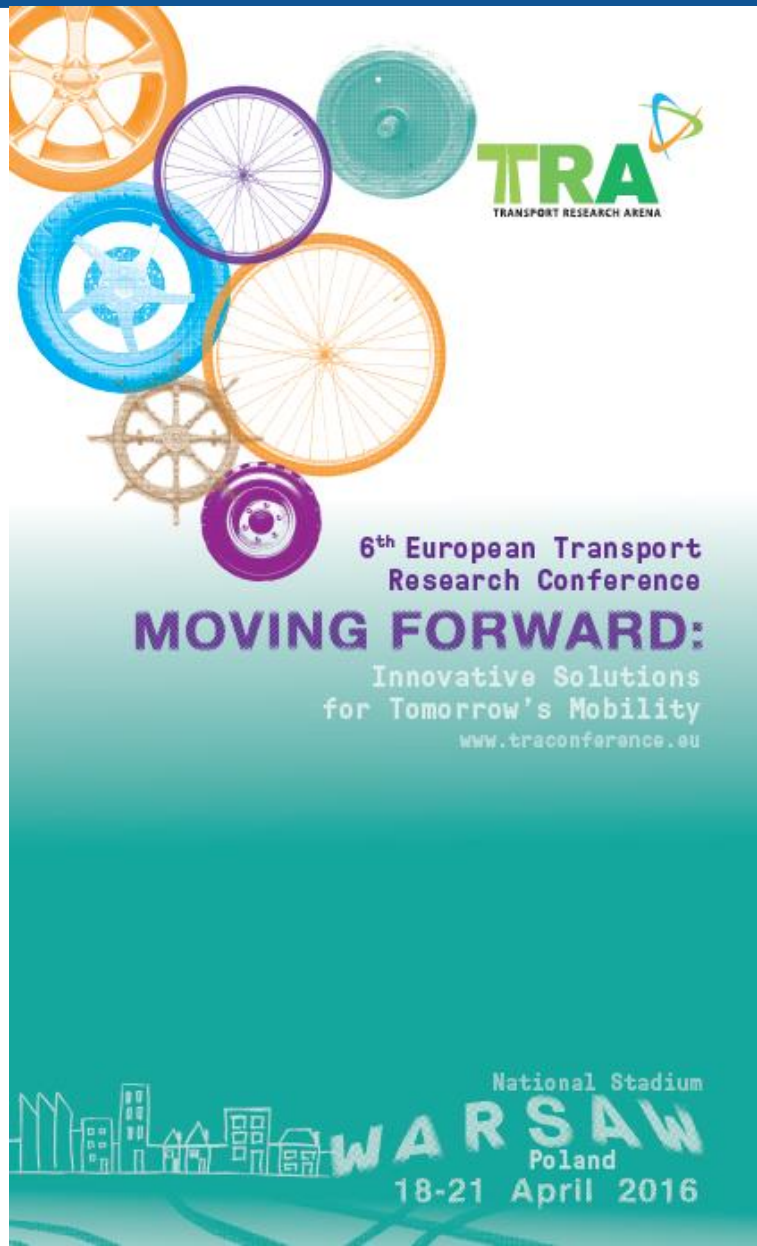
TRA 2016: 18-21 April 2016, Warsaw

6th European Conference on Transport Research (TRA)

Warsaw (Poland), 18-21 April 2016

Moving forward: Innovative Solutions for Tomorrow's Mobility

www.traconference.eu



Thank you
for your attention




Find out more:

www.ec.europa.eu/research/horizon2020
www.ec.europa.eu/research/participants/portal/page/home