

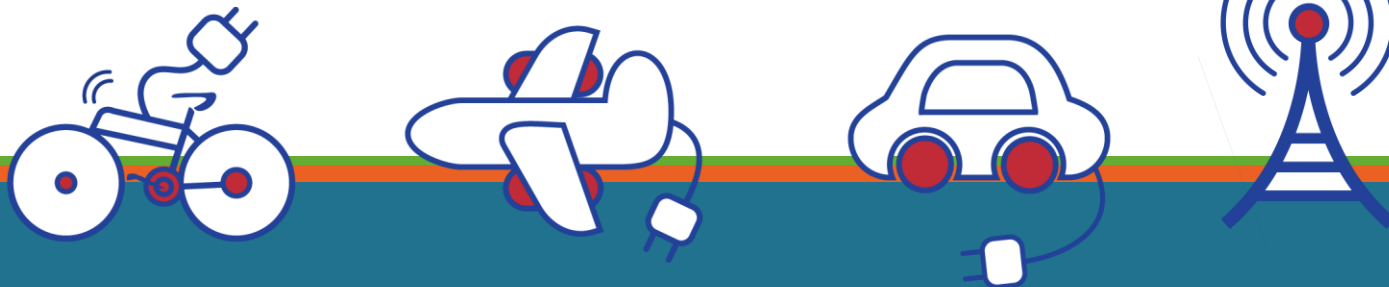
INTRASME

INNOVATIVE TRANSPORT SME SUPPORT ACTION

Barriers and opportunities for SMEs in EV technologies: from research to innovations

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Innovation Bridge Consulting Ltd

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www.intrasme.eu

Outline of talk

INTRASME Coordination & Support Action

- Objectives and outputs

EV supply chain and new opportunities for SMEs

Study on barriers and opportunities for SMEs

- How SMEs succeed in electromobility

Recommendations to the EC on how SMEs can be helped

INTRASME project support to SMEs

- How the EC, EGVI PPP and large companies can help

Project Overview and Objectives

- €1.44M FP7 Coordination and Support Action
- 8 Partners from Belgium, UK, Italy & Poland
- 2 year project: October 2012 - September 2014
- Identify barriers SMEs meet in EU R&D projects and help them transform results into products and services
- Improve SME innovation capacity by identifying difficulties and proposing solutions and recommendations.
- Establish innovation networks within and between EU regions through SME workshops and roadshows to strengthen entrepreneurship and integration in supply chains.
- Develop a package of guidance, case studies and support on-line to enable SMEs to take advantage of new market opportunities in EV and Smart Mobility technologies



INTRASME Outputs

Formation of 3 Electric Vehicle Innovation Networks in the West Midlands (UK), Piedmont (Italy) and Warsaw (Poland)

Market Opportunity Workshops, SME Opportunity Events and Roadshows

Innovation Network Support Platform and a Best Practice Toolbox containing guidelines on certification, standards, financing and business support (including IPR)

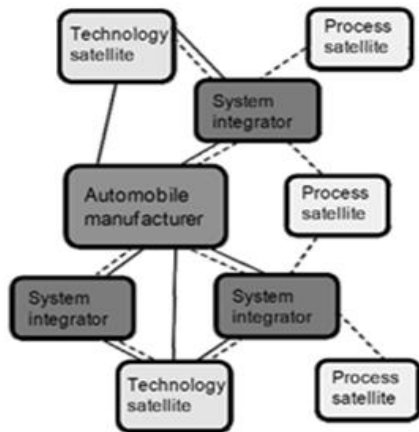
Support for SMEs in projects with high potential for innovation

A comprehensive set of studies and recommendations:

1. *Report on the evolution of new forms of transport;*
2. *Market opportunities and Case Studies Report;*
3. *SMEs: how they acquire new technologies in different regions of Europe;*
4. *Barriers to exploitation of SME innovations in EU R&D programmes;*
5. *SWOT analysis of regional activities and policies.*

New opportunities for SMEs

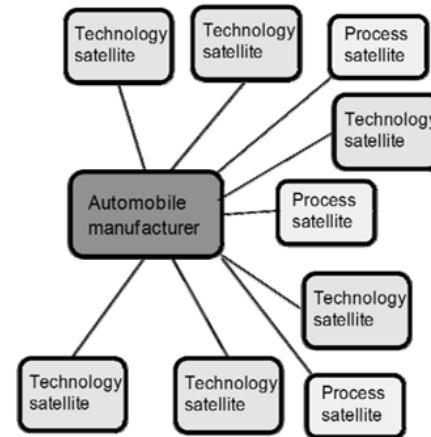
- In the transition to an electric vehicle powertrain the automotive value chain is changing → Opportunity window for SMEs
- EVs are not just electric cars → SMEs can diversify due to transversal technology synergies in the EV powertrain technologies
- SMEs can move faster → Development of novel technologies
- SMEs can develop not only components → Full electric vehicle
- SMEs can move faster and kick start the adoption of electric vehicleswith or without the mainstream large automotive companies.



ICE Structure*



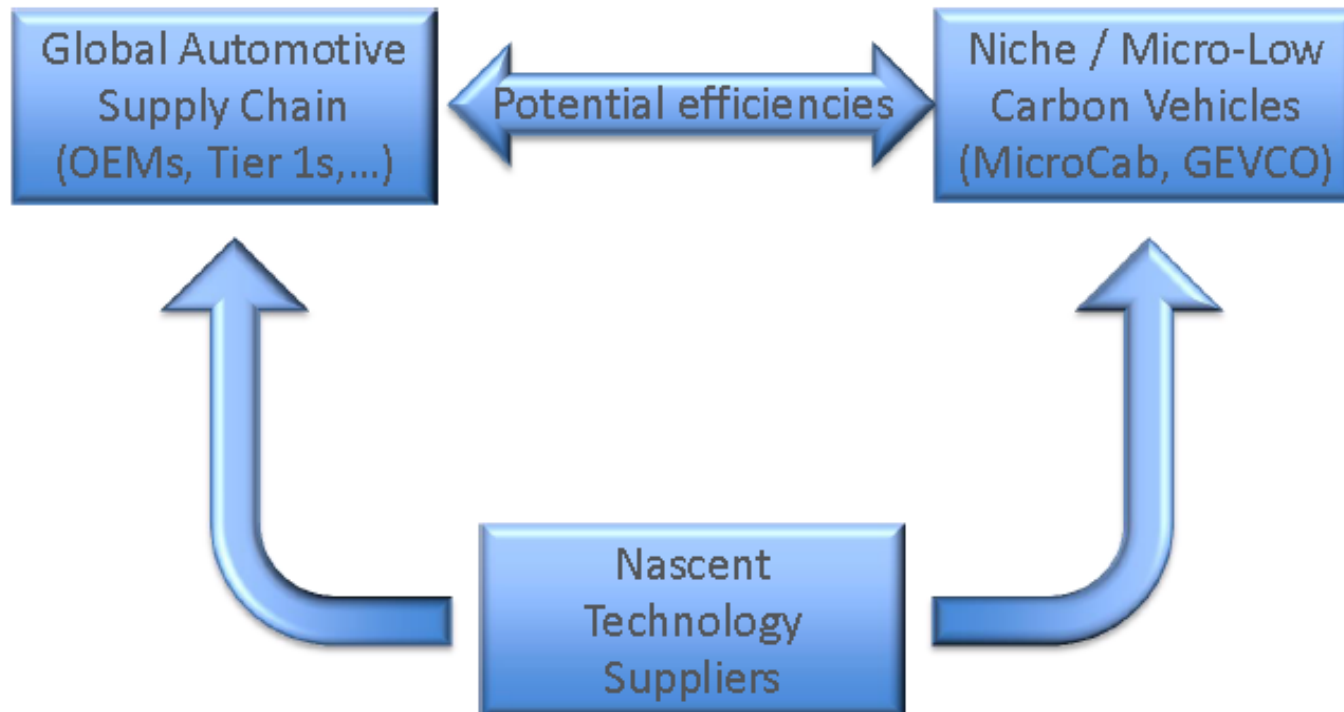
What will be the final structure of the supply chain?
Who will capture the value?



BEV Structure*

Source:
ENEVATE project

Developing supply chains - UK view



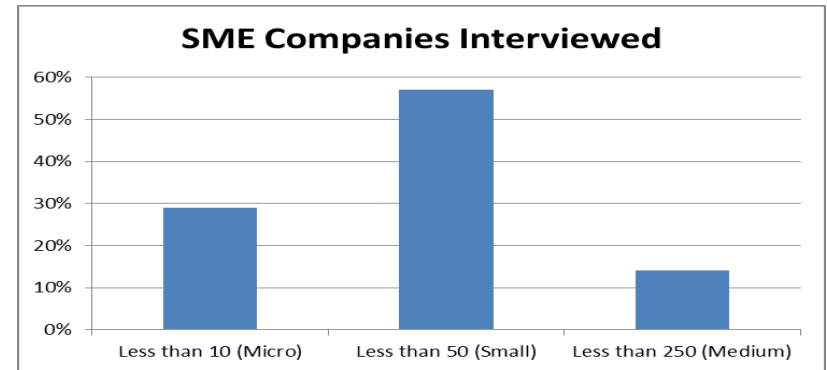
EC R&D projects and market impact –INTRASME study approach

- **168 projects analysed** covering FP7 Cooperation (Transport, ICT, NMP, Green Car PPP), People, Capacities, JTI (ARTEMIS, ENIAC, FCH, Clean Sky), CIP and ERANET+.
- Identification and study of a representative selection of EU funded transport-related R&D projects with significant SME involvement and high innovation potential in:
 - Low Carbon Land Vehicles – Electric and Hybrid Vehicles
 - Electric Water Vehicles
 - Light Aircraft – Low Carbon Solutions including Electric Aircraft
 - Smart Mobility / Intelligent Transport Systems
- Interviews of SMEs and large organisations working with them:
 - **14 Member States covered**
 - **57 SMEs mainly involved in national R&D projects**
 - **21 SMEs involved in 31 EC R&D projects (4 as coordinators)**
 - **10 large organisations involved in 21 EC R&D projects (mainly coordinators)**
- Analysis to establish common problems and barriers SMEs face
 - Validation of SME views and suggestions by large organisations
- Recommendations for INTRASME project and European Commission to help address SME innovation barriers

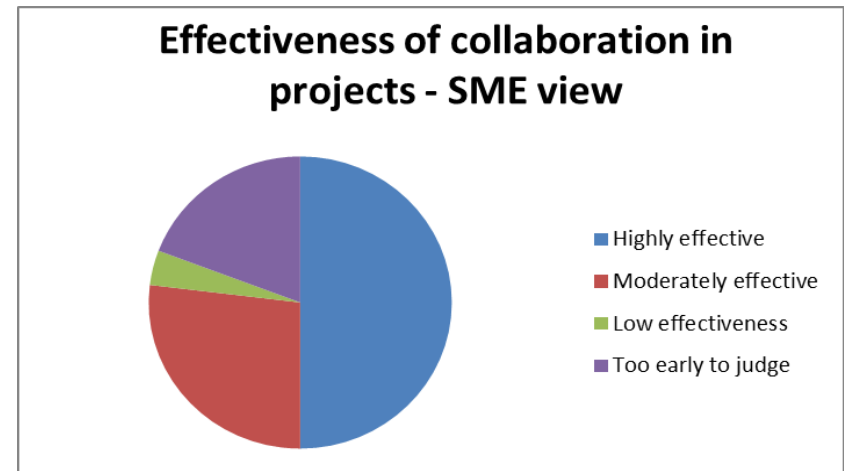
Benefits of participation cited by SMEs involved in EC R&D electro-mobility projects

- Raising profile and increasing credibility.
- Acquiring new knowledge and skills.
- Providing a broader market view.
- Strengthening collaboration with large industries and research institutes.
- Allowing researchers and engineers to interact at the working level, enabling SMEs with new concepts to learn what OEMs/ Tier 1s look for in production-ready technology.
- Possibility of developing future products/ services and working with project partners who can help them.
- Long-term funding allowing SMEs to risk employing people to develop new solutions.

SMEs interviewed ranged from micro-SMEs to medium SMEs with 240 staff



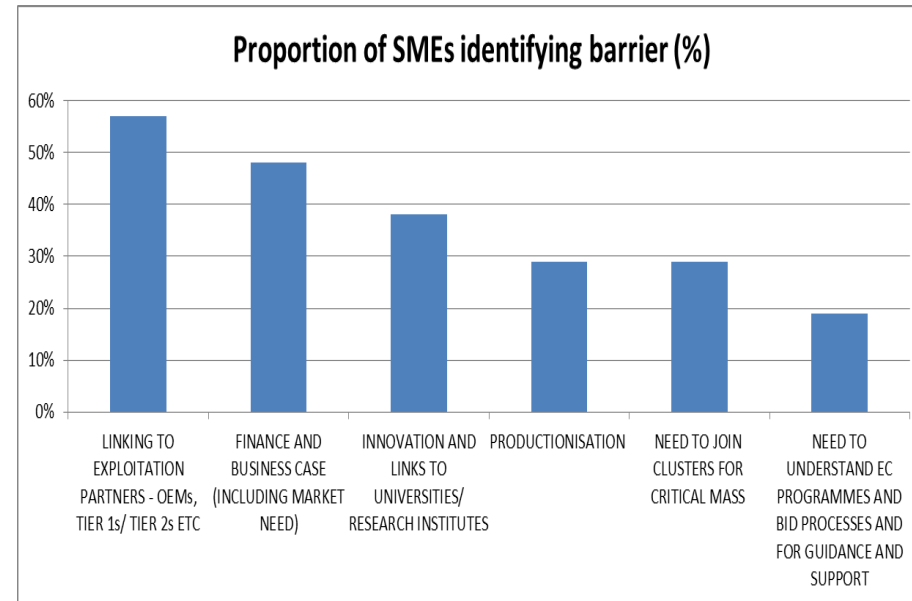
SMEs in EC R&D projects are generally happy with the level of collaboration



Barriers to SMEs developing and exploiting their innovations

Main barriers cited by SMEs involved in EC R&D projects are:

- Linking to exploitation partners to effectively exploit their ideas
- Accessing finance is hard and made more difficult by uncertain demand and lack of market pull
- SMEs sometimes feel disconnected from research in academia but lack the time to develop collaborative relationships
- Taking working prototypes through to production is too expensive for many SMEs
- SMEs (especially micro-SMEs) sometimes require support from larger networks to give them access to tools and knowledge they need but do not have the resources to acquire



A major barrier to involvement in EC R&D projects is PERCEPTION of difficulties and problems – once SMEs are involved they are generally happy with the collaboration

How SMEs succeed in Electromobility (1)

SME view of current EV/ ITS market:

- Immature with some well-developed niches of activity e.g. Electric Golf Buggies, but low market penetration in areas such as automotive and aircraft
- Collaborative R&D, e.g. with Universities is important in early product development stages
- Two 'valleys of death' in the development of products:
 - Feasibility stage: funding is usually accessible for early stage R&D (own funds, public support)
 - **Production stage: funding gap and greater challenge for SMEs**

Successful SMEs that commercialise their products use the following strategies:

- Acquire a strategic partner to exploit or invest in the technology
- Offer to serve different markets with their product/ competency
- Develop services to cross-subsidise their main product
- Focus on highly customised products/ systems for customers

How SMEs succeed in Electromobility (2)

SME views of how other stakeholders can help:

- Primary Customers (e.g. larger companies higher up the value chain) can play a critical role by encouraging open relationships with suppliers or between groups of potential suppliers
- Other technology networkers such as retailers, market specialists operating in the EV/ ITS market can help SMEs acquire a holistic view and facilitate new routes to market

Identification of a route to market (often through support of other companies) is key to get through the main production 'valley of death' stage

- Local and national authorities can play an important role by advocating EV/ ITS adoption and reducing the level of uncertainty in the supply chain which blocks investment, through e.g.:
 - Brokering of mixed industry clusters of potential buyers and technology developers
 - Procurements of EV fleets
 - End-user incentives
 - Credit guarantee schemes for production

The development of a lead market for EV production requires the coordination of regional actors in the supply chain system

EU projects – barriers to exploitation of SME innovations

| Barriers in order of importance | Proportion of SMEs (%) |
|---|------------------------|
| LINKING TO EXPLOITATION PARTNERS - OEMs, TIER 1s/ TIER 2s ETC | 57% |
| FINANCE AND BUSINESS CASE (INCLUDING MARKET NEED) | 48% |
| INNOVATION AND LINKS TO UNIVERSITIES/ RESEARCH INSTITUTES | 38% |
| PRODUCTIONISATION | 29% |
| NEED TO JOIN CLUSTERS FOR CRITICAL MASS | 29% |
| NEED TO UNDERSTAND EC PROGRAMMES AND BID PROCESSES AND FOR GUIDANCE AND SUPPORT | 19% |

RECOMMENDATIONS TO EC

- EXPLOITATION OF PROJECT RESULTS
- BROKERAGE & NETWORKING EVENTS
- PROJECT INSTRUMENTS AND MECHANISMS

How can SMEs be helped – Recommendations to the EC

EXPLOITATION OF PROJECT RESULTS

- 1 – Financial Exploitation Partners – Access to Finance instrument in Horizon 2020
- 2 – Mid-way Review of Exploitation Plans
- 3 – EC support to potential exploiters of EC project ideas
- 4 – Seek EC help in brokering between SMEs and Exploitation Partners
- 5 – Follow-on projects to exploit the outcomes of successful projects

BROKERAGE & NETWORKING EVENTS

- 6 – Involve SMEs in Green Vehicle Concertation (Project Coordinator) Workshops
- 7 – Completed Project Concertation Events
- 8 – Encourage SME involvement in JTI Brokerage Workshops

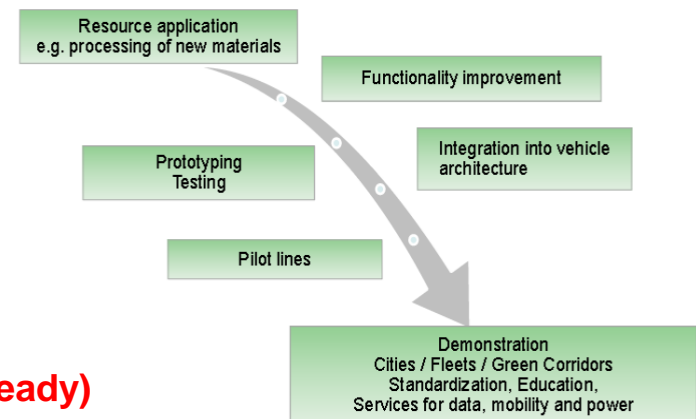
PROJECT INSTRUMENTS AND MECHANISMS

- 9 – Market data projects for SMEs - New SME Instrument in Horizon 2020?
- 10 – Short feasibility studies by SMEs – New SME Instrument in Horizon 2020
- 11 – Future Emerging Technologies (FET) for SMEs
- 12 – Productionisation Projects (to show ideas are production ready)

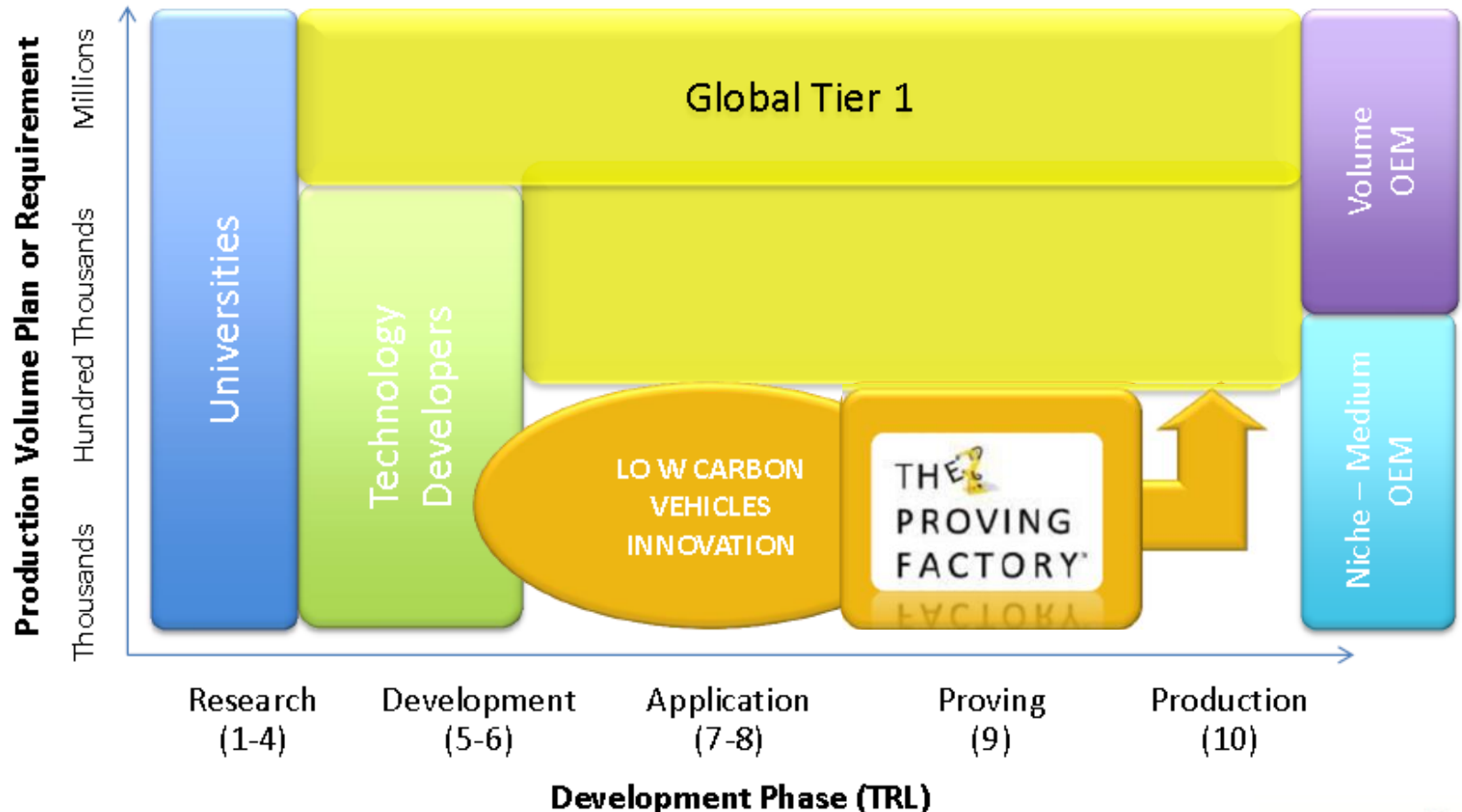


EGVI in Horizon 2020

Addressing the **whole Process Chain** from resource application to demonstration, necessary to deliver **Innovation**.



Overcoming the Productionisation Barrier – UK approach (1)



PRODUCTIV
Driving green technologies

TATA STEEL

MIRA

mtc
Manufacturing
Technology Centre

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**INNOVATION
BRIDGE**

Overcoming the Productionisation Barrier – UK approach (2)

The Proving Factory

- A £22M collaborative Government/ Industry project to industrialise and validate new powertrain technologies and supply them to vehicle manufacturers, involving:
 - Productiv – SME Technology Exploitation & Industrialisation experts
 - Tata Steel – Materials development and component manufacturing
 - MIRA – Design Verification
 - MTC – Design for manufacture and assembly
 - Jaguar Land-Rover, Schaeffler, Unipart, Midlands Assembly Network
- A pipeline of technologies will be selected for industrialisation prior to manufacture:
 - First six companies selected and industrialisation underway
- Will ultimately manufacture low volume advanced technologies for vehicle manufacturers, with a target of 1,000 to 20,000 units per annum for each of 10 to 20 products
 - Low Carbon technologies is main focus

INTRASME project support to SMEs – how the EC, EGVI PPP and Large Companies can help (1)

Seeking EC/Industry help in brokering between SMEs and large companies that can help exploit SME innovations

- What mechanisms can be used?
 - INTRASME would like to establish if there are suitable EC/EGVI networks and communication mechanisms that could help SMEs developing EV/ITS technologies find exploitation partners
 - For example, INTRASME would like to connect into CLEPA and its SME Working Group

EGVI-supported Concertation/Brokerage Workshop (recommended by coordinators and SMEs)

- INTRASME is investigating the feasibility of working with other EC projects and stakeholders to set up a Concertation/Brokerage Workshop to help SMEs link to exploitation partners (and also to finance partners)
 - Important to involve Coordinators of EC Green Car/Vehicle projects that are interested in finding new technologies and in working with SMEs to jointly develop and integrate them
 - Concertation events have been organised in the past to allow cooperation between EC projects and project coordinators, but have not had major SME involvement
 - Who should we work with?

INTRASME project support to SMEs – how the EC, EGVI PPP and Large Companies can help (2)

Productionisation Projects (to show ideas are production ready)

- Are there opportunities within Horizon 2020/EGVI PPP for promising SME technologies to be selected (by potential exploitation partners) and industrialised?

Smart Specialisation and regional network ‘clustering’

- SMEs (especially micro-SMEs) value being part of a larger community or network which gives them access to tools and knowledge they need, e.g. new low carbon transport opportunities
- There are interesting examples such as the Torino e-District in Italy and in the UK West Midlands where SMEs are joining together (and with manufacturing partners) to aggregate capability to achieve critical mass and jointly pursue new opportunities in electric vehicles

How will Horizon 2020/ Structural Funds support Smart Specialisation and regional networks/ clusters where SMEs work together to achieve critical mass?