



EPOSS Event, Berlin

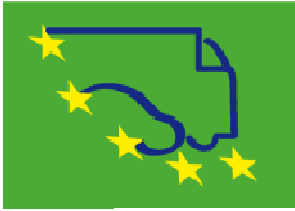
10 Sept. 2010

Green Cars – Forward Thinking

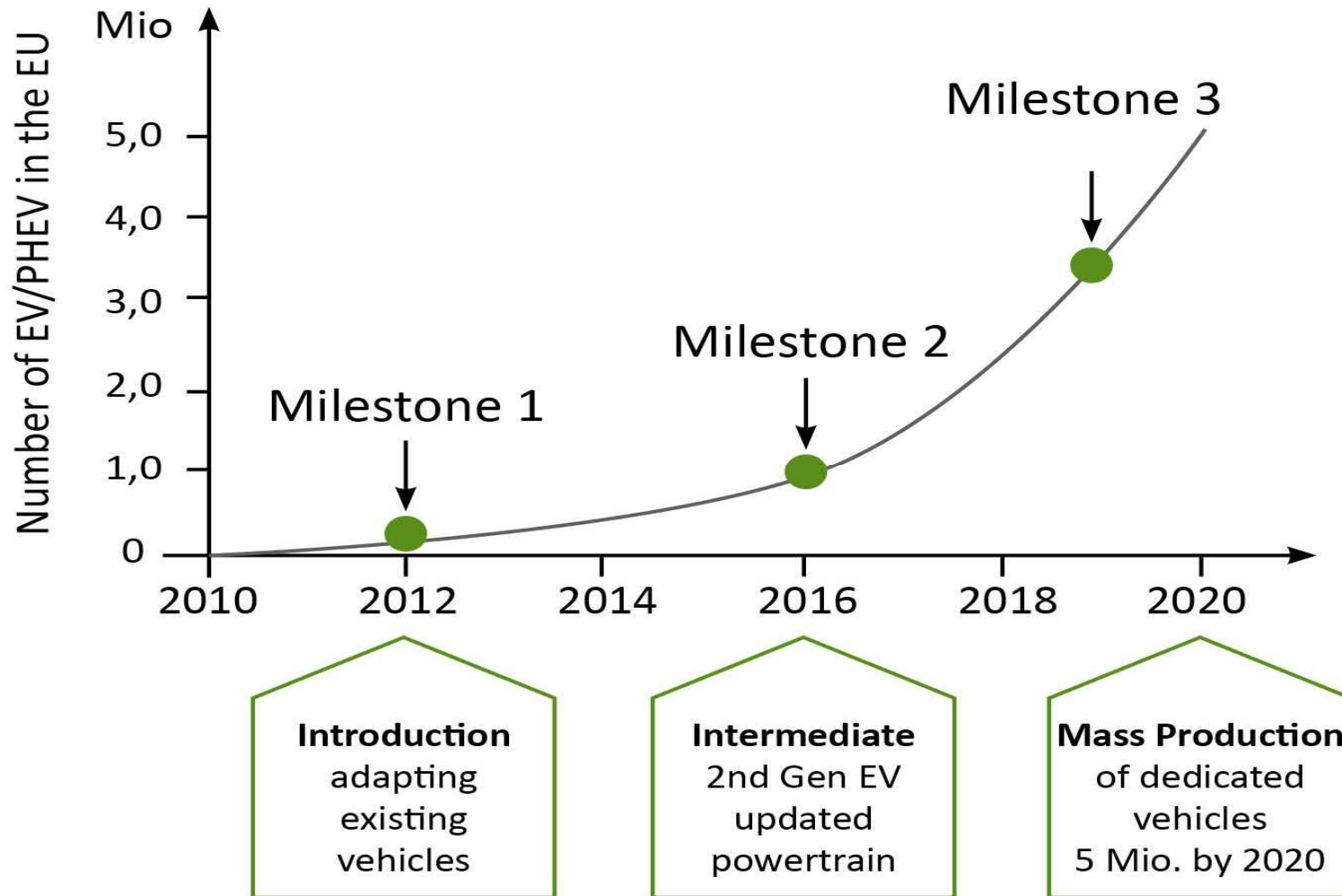
Nevio Di Giusto

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**Representating FIAT Group in EUCAR, ERTRAC, EPOSS &
Green Cars Industrial Advisory Group**



Electrification – A progressive evolution requiring focus and coordination to ensure EU production of the critical components

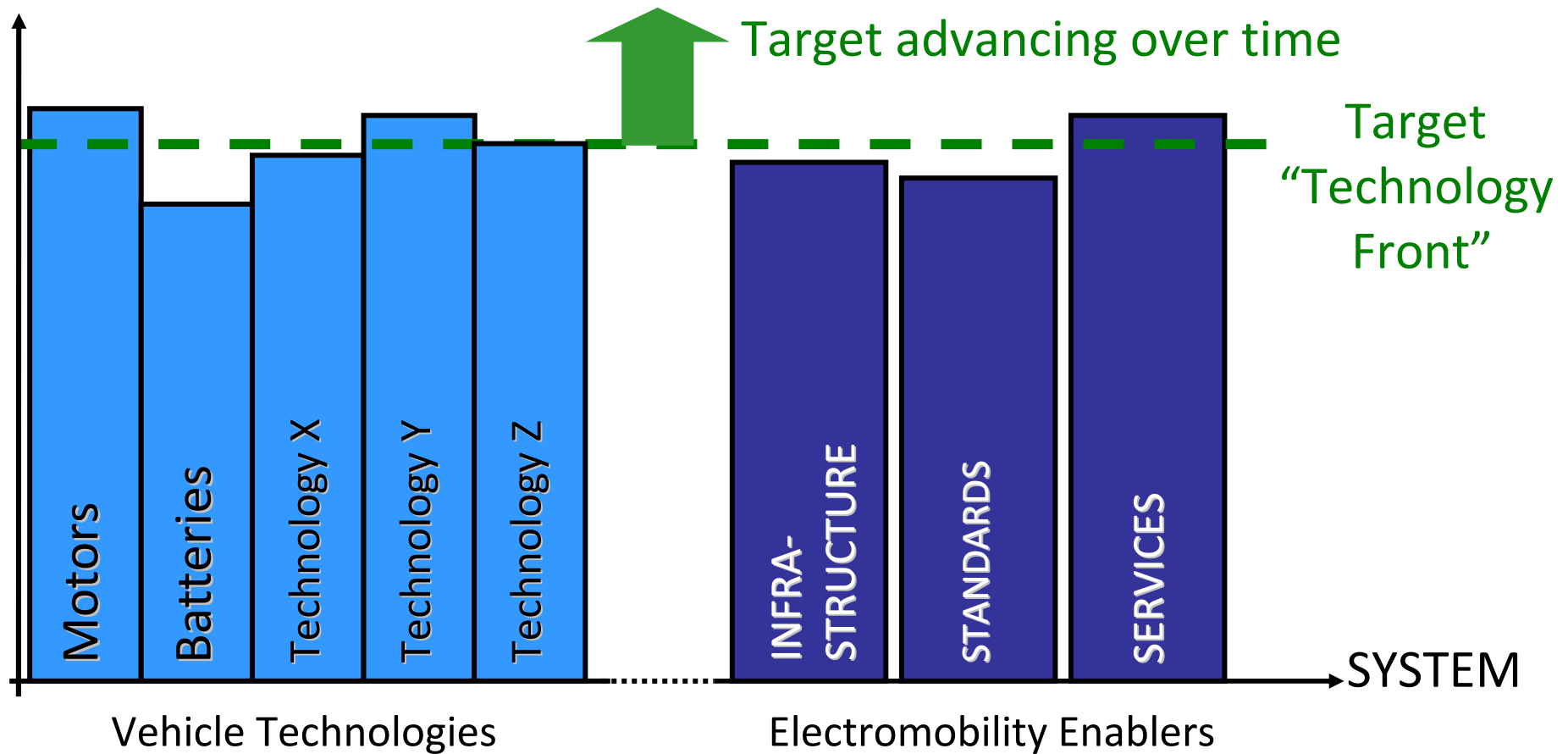


Source: Ertrac-EPoSS-SMARTGRID “EU-Electrification Roadmap Sept 2009”



Need for Synchronisation of Solutions

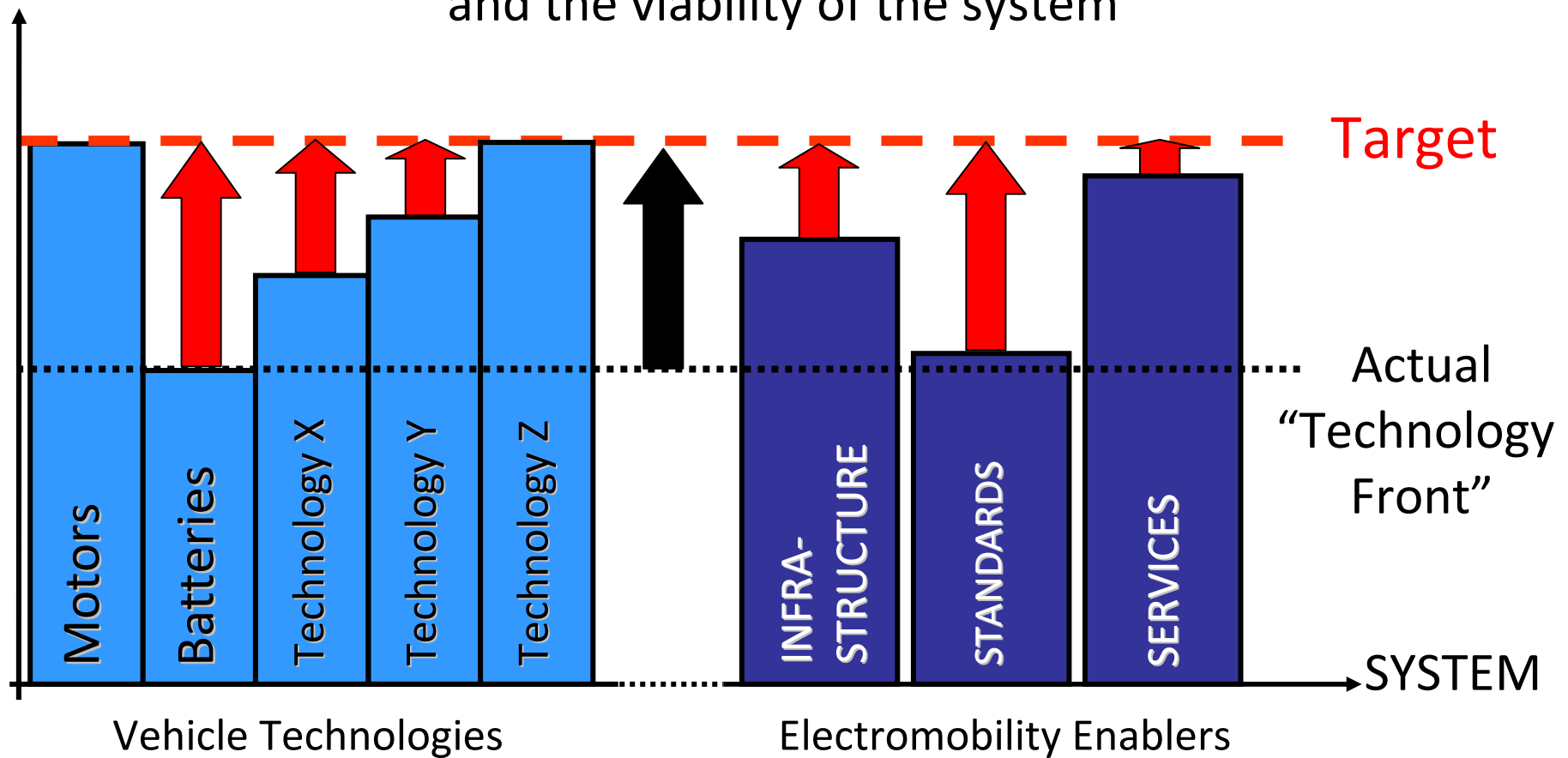
Ideally the state-of-the-art of the vehicle and other enabling technologies should be aligned and advancing simultaneously





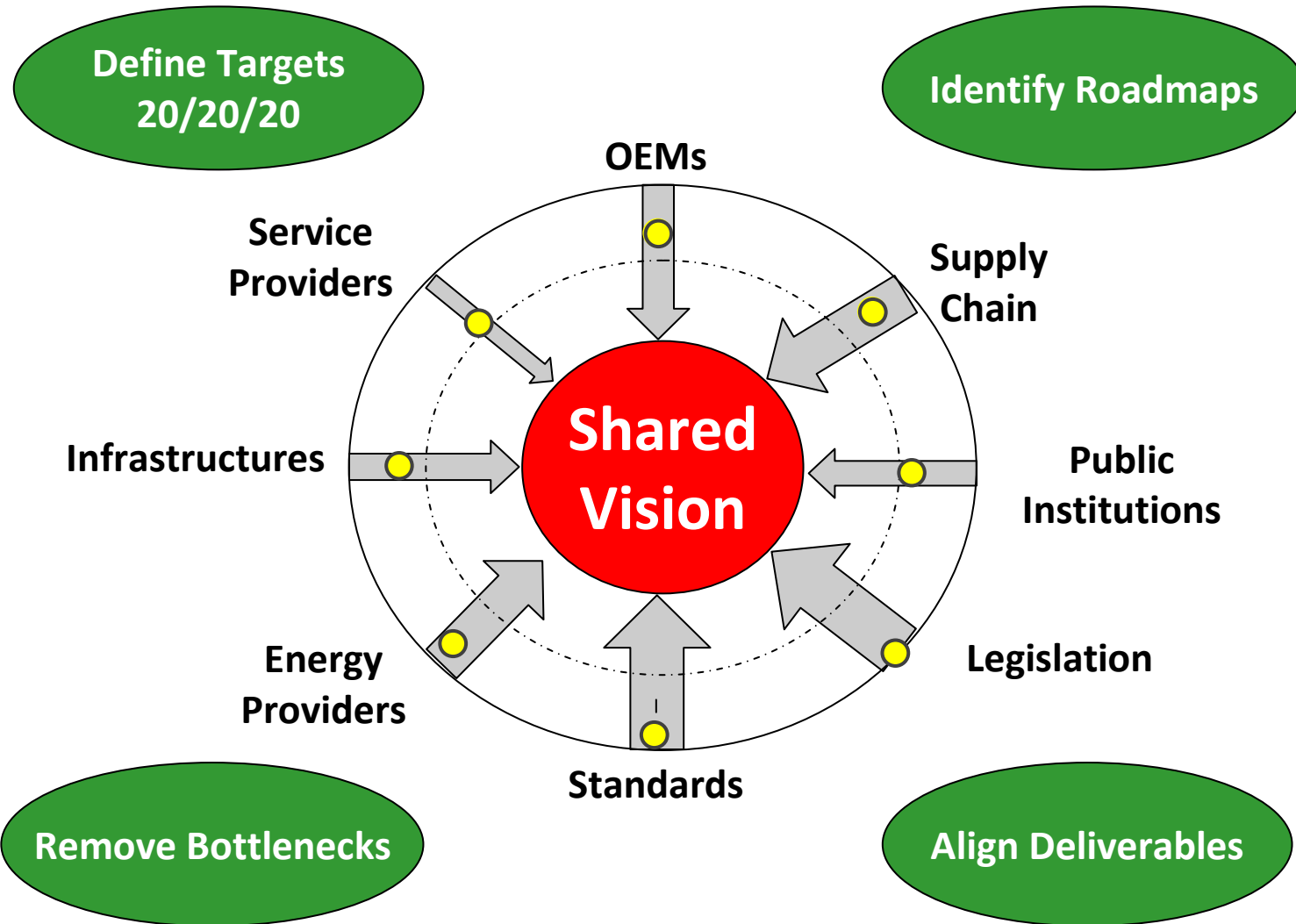
Need for Synchronisation of Solutions

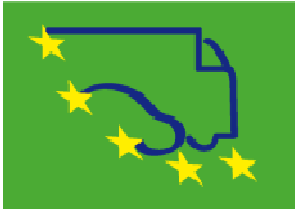
In practice the need for alignment dictates the level of the significant investments required immediately and the viability of the system





Absolute Need for an Integrated Approach





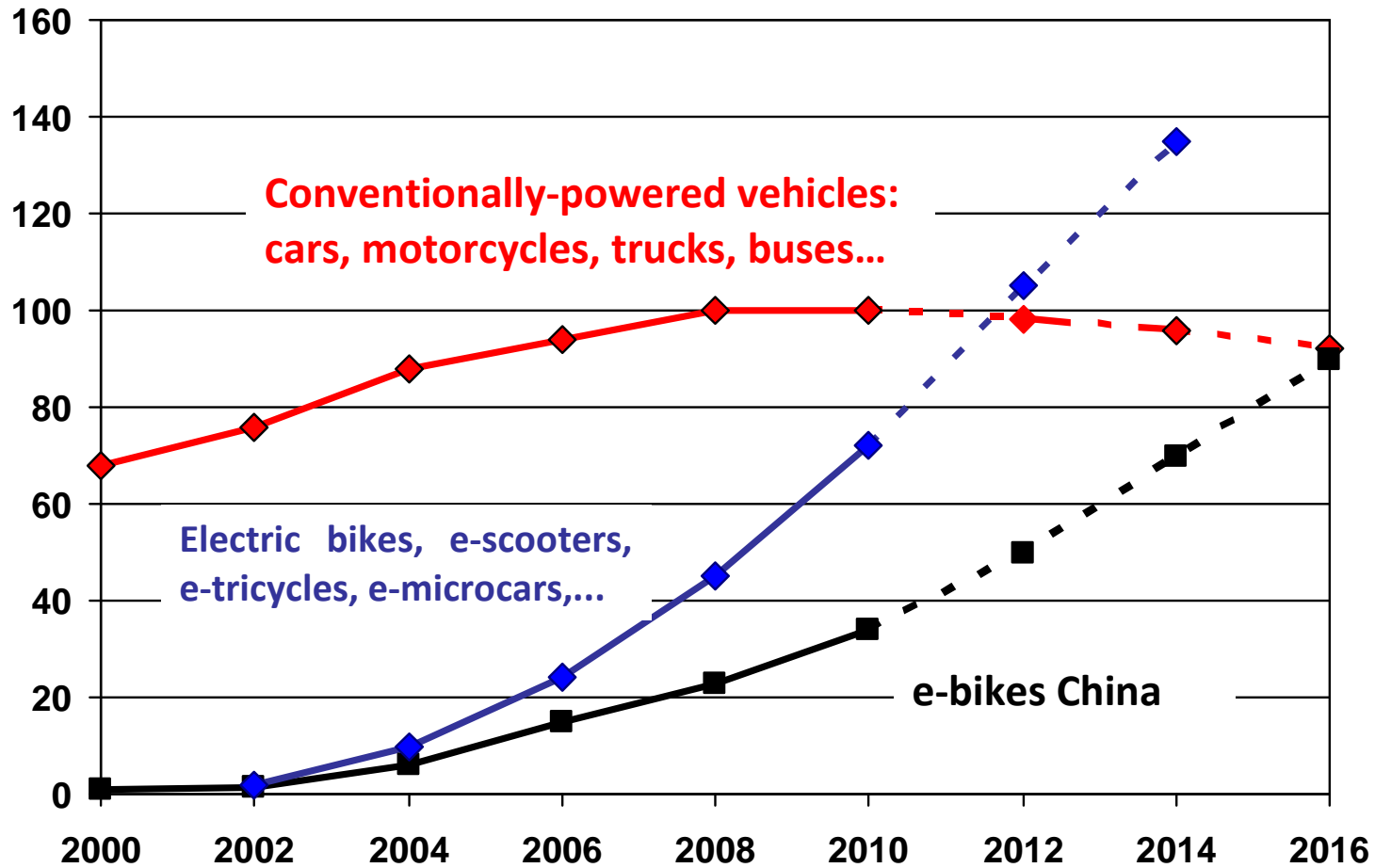
Where must we focus to remain competitive?

**Which new opportunities, offered by electromobility,
do we need to grasp?**





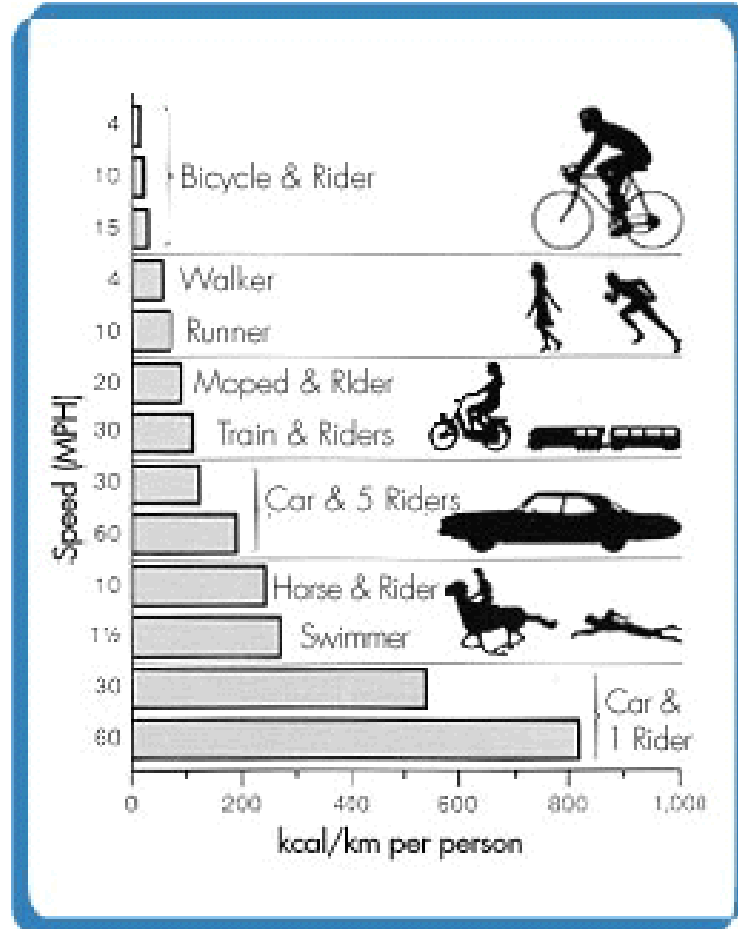
Electromobility - Already a reality



EU 2010 > 1 mil E-Bikes . World 2012-2016: > 450 millions sales of E-Bikes
(Source: *Electric Bikes Worldwide Reports – 2010 Update*)



Beyond Green Cars: Responding to demand by identifying optimal solutions



Reducing:

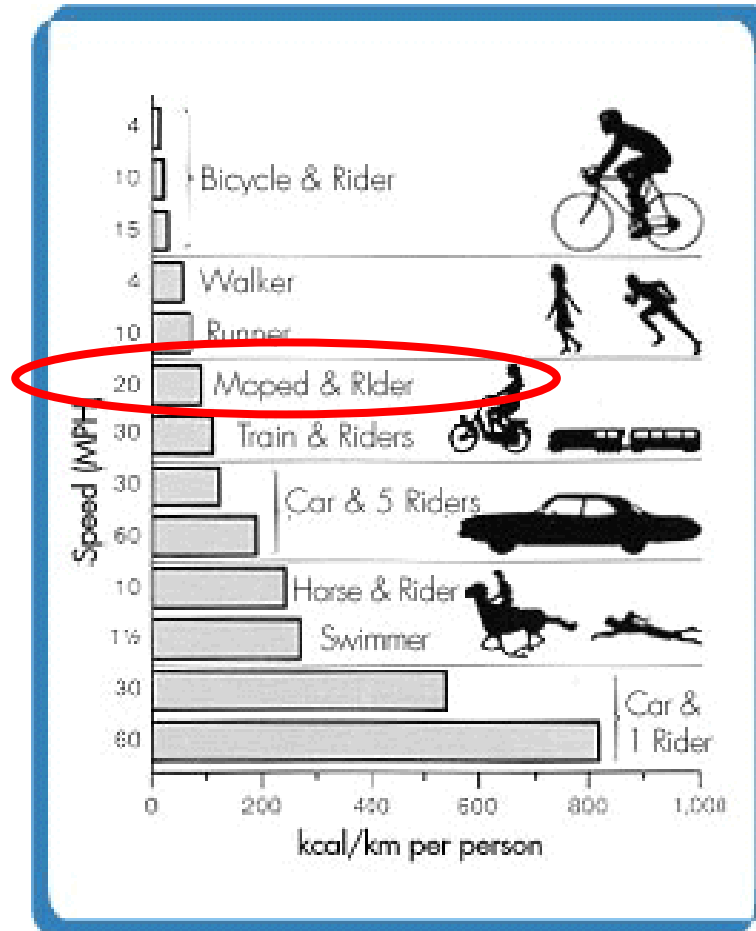
- the use of raw materials
- energy consumption
- and emissions

Cycling requires about half the energy of walking.

Electric pedal assisted bikes run on 1.0 kilowatt-hour per 100 km (0.036 MJ/km).



Beyond Green Cars: Responding to demand by identifying optimal solutions



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Electromobility – Addressing evolving customer demands

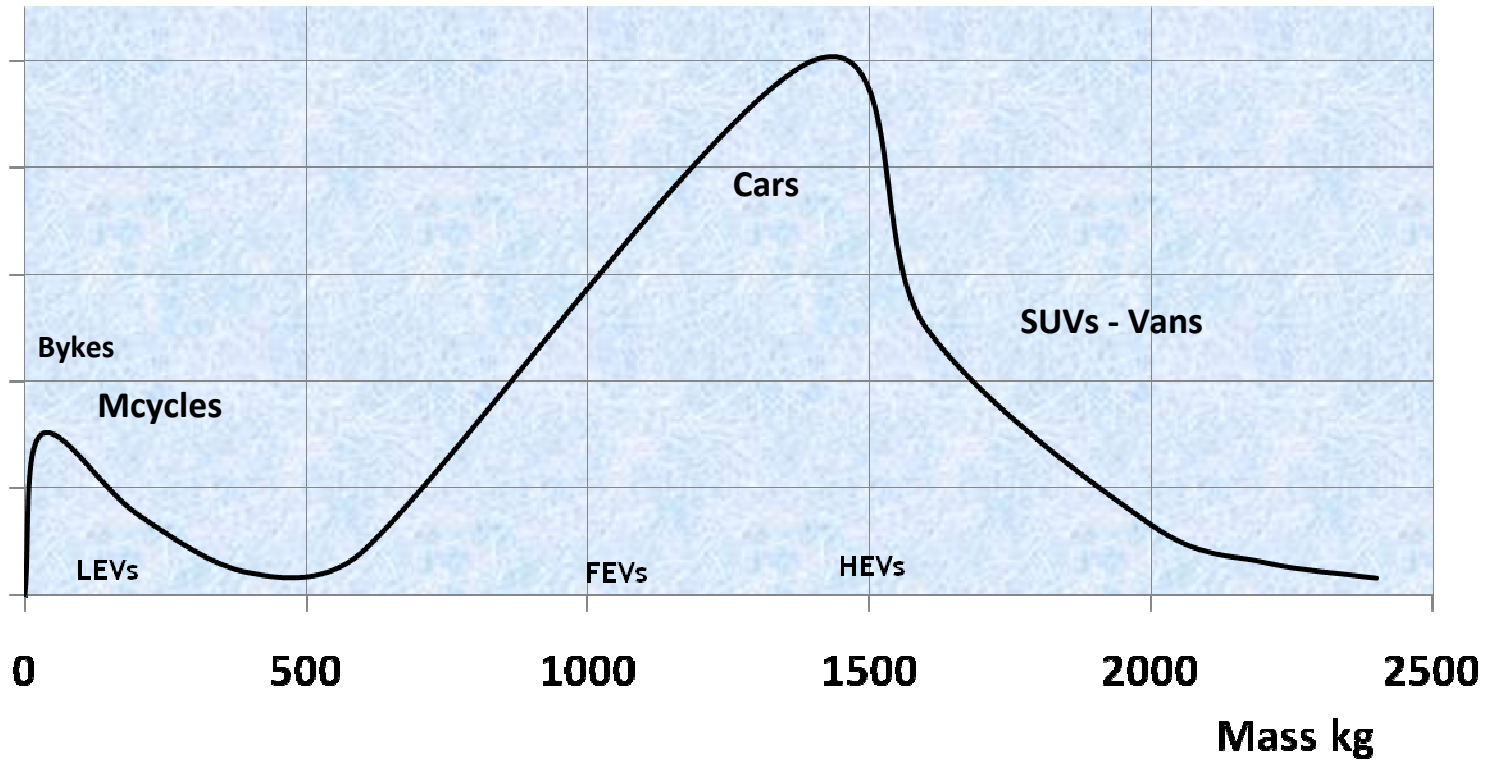
Type	Light EVs (e-Bike) <35kmh	Light EVs (other) <50kmh	Micro Cars <80Kmh	Mini Cars NEDC	Mid size Cars NEDC	Large Cars NEDC
Weight kg	15-50	50-300	300 -700	700 -1100	1100-1500	1500-2000
Energy kWh/100km	1-2	2-3	4-9	9-12	12-18	18-25
kg/100km of Li- ion battery pack level (180Wh/kg)	6 -11	11-17	23-50	50-67	67-100	100 -139

Responding to **evolving customer demands** is fundamental for the success and viability of EVs.



Road Mobility in the EU in 2010

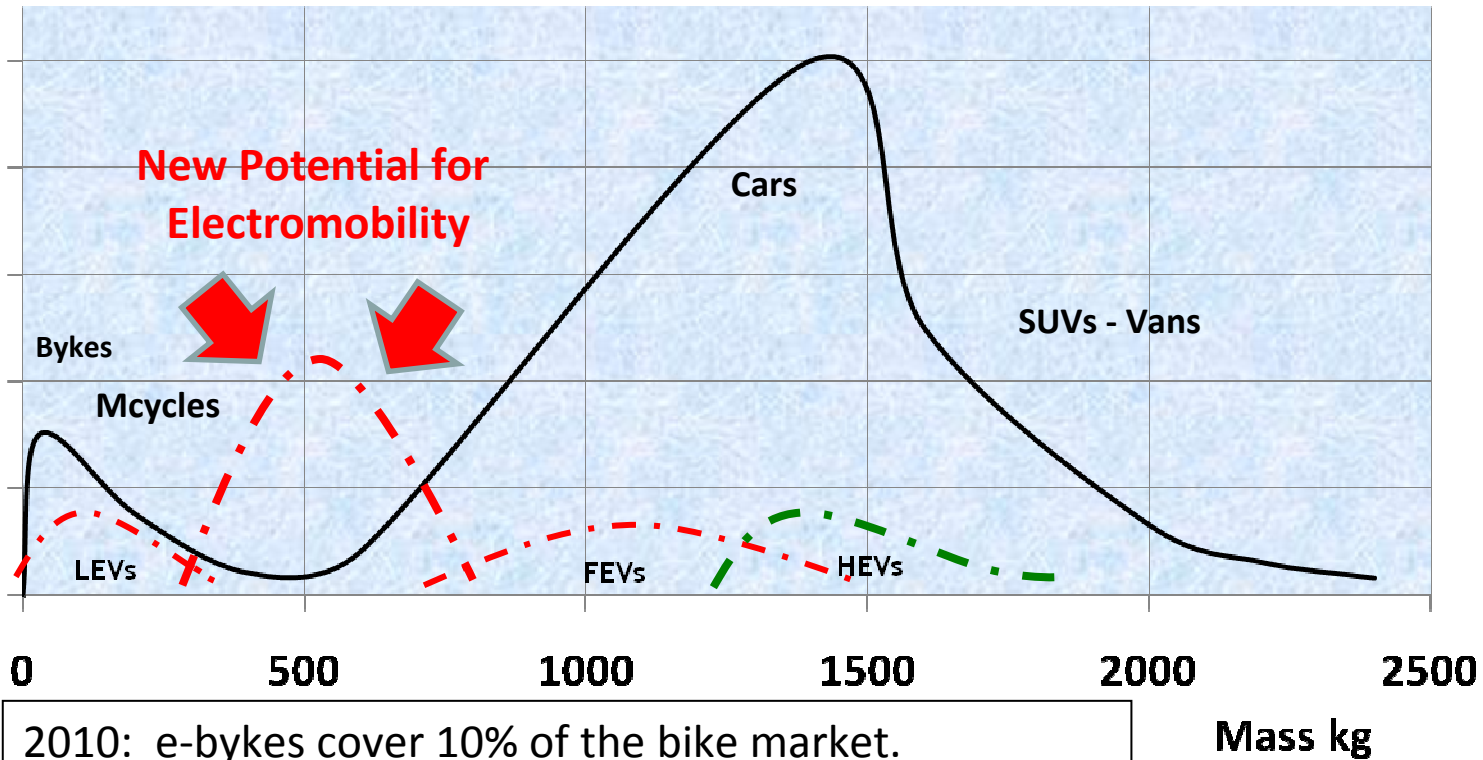
km run by mode normalized to a 1400kg car.





Road Mobility in the EU: Electromobility potential by 2020

km run by mode normalized to a 1400kg car.

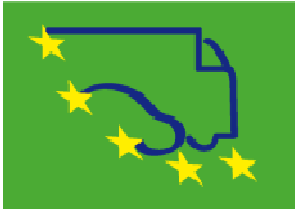


2010: e-bykes cover 10% of the bike market.
2020: e-bykes (LEVs) likely at 50% of the bike market
2020: e-cars (FEVs) likely at 5-7% of the car market.
2020. Hybrids (HEVs) at 3-5% of the car market.



Beyond Green Cars: Accelerating the process of electrification in the EU

- Electrification of conventional cars will follow a step-by-step approach starting from small vehicles and expanding to cover a wider portion of the urban mobility and transport needs.
- Electrical mobility in a urban environment offers new solutions which thermal engines cannot easily meet – in particular, small and clean ICE-powered vehicles require costly and complex catalytic solutions and radical downsizing implies a reduced overall efficiency.



Beyond Green Cars: Accelerating the process of electrification in the EU

The investments required for technology development and mass production of Li-ion batteries will be shared with other applications areas that before 2020 may grow even faster than that of Electrical Vehicles;

- LEVs are already a reality
- High demand for batteries is expected from Renewable Energy by 2015
- Other areas such as Aeronautics and Robotics will contribute with limited but important demand by 2020.

The collaboration with other concurring sectors is still an issue to be addressed !



Conclusions

- **The decarbonisation of road transport and mobility represents a Major Societal Challenge in terms of : health, energy, competitiveness, employment**

- **Decarbonisation must continue to be pursued through several parallel routes:**
 - ❖ Advanced, downsized ICEs with conventional & alternative fuels
 - ❖ Mild to Full Hybrids
 - ❖ Electric Vehicles: PH-EVs, ER-EVs, B-EVs, FC-EVs.

- **The absolute need exists to follow an Integrated 360° Approach:**
 - ❖ Involving all stakeholders with a shared vision and responsibilities
 - ❖ Identifying market uptake policies
 - ❖ Removing bottlenecks to implementation
 - ❖ Investing to enable the synchronisation of solutions
 - ❖ Scheduling advances over time also in terms of vehicle evolution and lifecycle

**Electrical mobility offers new opportunities
Be focused on Full Electrical Vehicles!!**



THANK YOU

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