

# Powertrain roadmaps

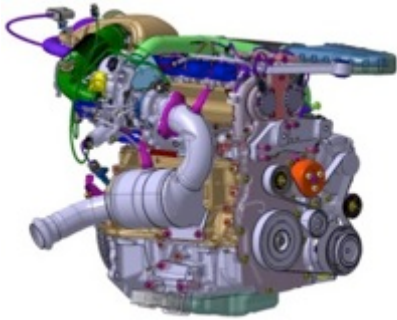
3 key messages  
based on current projects

**G. EURIN**  
**VP Innovation Projects for CO2 & Environment**

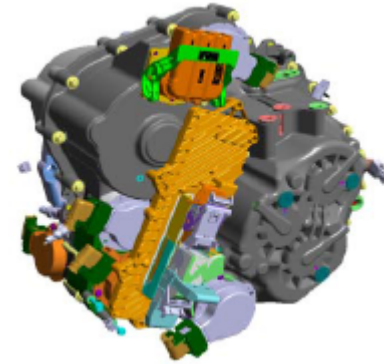


# Main priorities for Alliance R&D for CO2 & environment

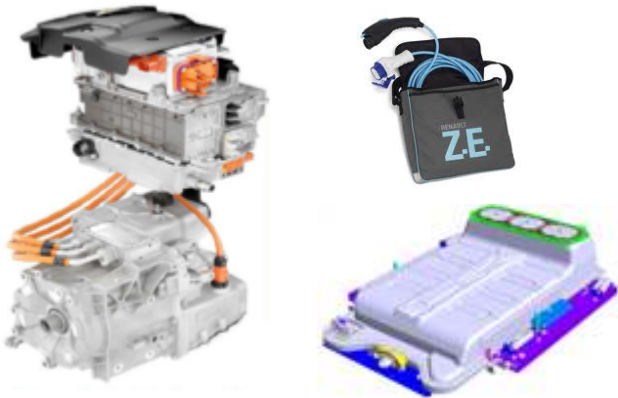
## ICE efficiency improvements



## ICE electrification : Mild & P HEV



## EV cost & range breakthroughs

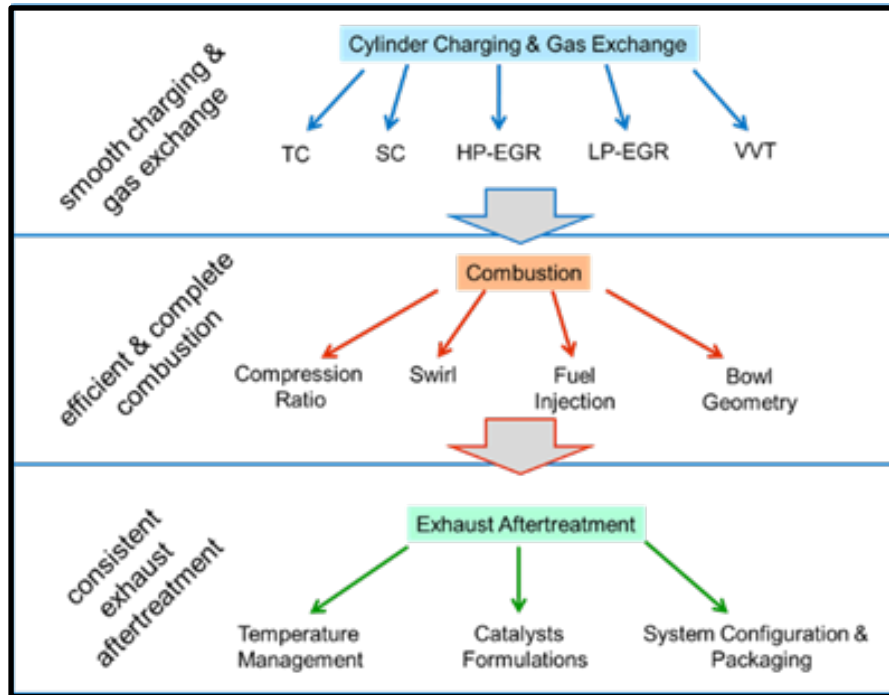


## Lightweight solutions including PWT





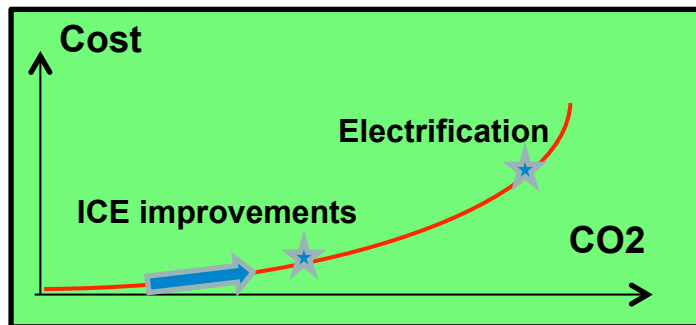
## 2. Internal Combustion Engines will remain the cheapest contributor to CO2 improvement in the coming 10 years



### REWARD example :

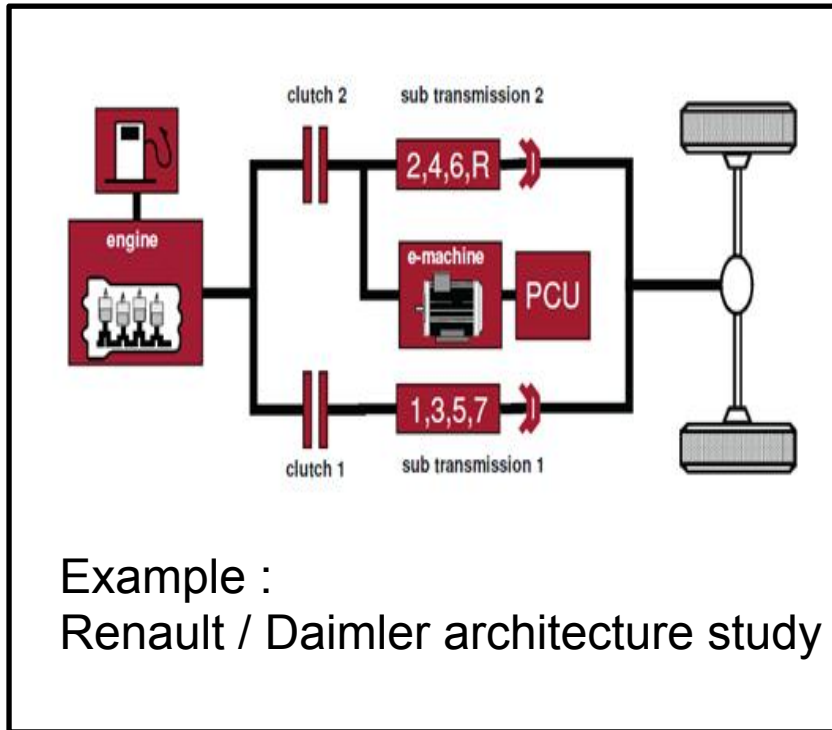
An holistic approach for the enhancement of the thermal efficiency and an improvement of the combustion quality with ultra low emission regulations

Budget	~13 M€	Duration : 36 months
Funding	~10 M€	Start : May '15
Partners AVL, CRF, Renault, Volvo Car, Delphi, Ifpen, CNRIM, Johnson Matthey, Ricardo, Schaeffler, LMM, Uniresearch, VIF, Chalmers CTA, Czech TU, UPVLC		



**OEMs will need further help to go on improving Thermal Engines efficiency**

# 3. Electrification 'critical for both CAFx and « fun to drive improvement »' is the next step

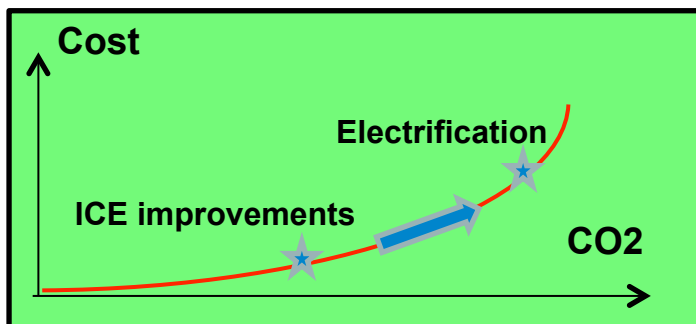


## ECOCHAMPS example :

A collaborative project on hybrid to

- Improve P/T efficiency up to 20%
- Reduce P/T weight & volume by 20%
- Reduce hybrid cost by 10%

Budget	~28 M€	Duration : 36 months
Funding	~ 21 M€	Start : May '15
Partners DAF Trucks - DAIMLER – IVECO – MAN - FIAT – Renault – university - engineering company - suppliers		



High development costs :  
help needed to launch these  
new technologies