

Vehicle Engineering

*Mac Summit : Are we ready for 2011 ?
February 17, 2006*



RENAULT



- 1 Renault and CO2 technology
- 2 Performances and small vehicle
- 3 Durability and reliability
- 4 Costs
- 5 When will suppliers be ready ?



What has been done in Renault on CO2?

- Different tests on CO2 system
 - Tests bench
 - Car prototypes
- RFI : Request For Information to suppliers in 2005
 - To evaluate suppliers technologies
 - To take into account constraints and packaging required by new refrigerants components
 - To define solutions with the best compromise of quality, costs and timing
- ➔ More than ten suppliers answers
 - Systems suppliers, pipes and hoses suppliers, compressors and exchangers suppliers



Performances

- Good performances on driving condition
- Significant drop of performances at idle and in urban cycle
 - Not acceptable

Today's components seem to be designed for large cars :

- Compressors with external control, variable and large displacement.
 - Add IHX, PT sensor, security devices
- Barely few proposals for low cost, small cars.



Durability

■ Compressor, pipes and hoses

- Not enough results of durability
- Renault has not a good forecast for durability expectations
 - ➔ For example, one answer was only 100 000 km for compressor durability commitment !
- Components proposed are prototypes

■ Leakage

- management of high pressure
- servicing < 5 years is far less than current situation



Cost overrun

- Calculated over costs on price given by suppliers has between 100 € to 300 € surcharge on the system, even for huge volume scenario (1M car/year). This represents 150 to 400 €/ t Co₂!
- No clear explanation to justify these over costs
- Very difficult to support such an over cost on our vehicles.
- No forecast on price decrease over the years
- It proves an immature technology



Current suppliers panel

- To launch a car in 2011, RFQ must be held at least 4 years before
 - RFQ prerequisite is that most of suppliers are able to master the technology in 2007

- Suppliers selection means :
 - Volume commitment from OEM
 - A/C system, A/C controls, tuning defined
 - Payment of engineering costs to the suppliers
 - Costs and quality commitment from suppliers

- **Renault's opinion is that such commitments will not be possible in 2007.**



- 6 majors suppliers for HVAC and controls
- 5 (+ 1 new) suppliers for compressor
- ➔ According to Renault's opinion, only 2 suppliers will be able to answer correctly for a RFQ to be issued in 2007
- Answer correctly means :
 - Stable definition
 - Durability proved
 - Process clearly studied
 - Realistic costs
- ➔ **Huge impact on car industry**
 - Suppliers which are not ready will suffer from market losses
 - Car makers will suffer with cost increase due to quasi monopolistic situation
 - Ramp-up to be done in a very short time.
- ➔ **As, this is not acceptable, we need to confirm the development status of CO2 A/C loops in 2007.**



THANK YOU!