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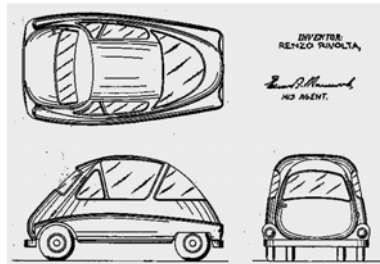
Design of ECO City Car

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



2005 2006 01 Preparation: Studying Little Cars

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



A HISTORICAL EXAMPLE:
BMW ISETTA was originally designed for the Italian Isomoto car company by Renzo Rivolta, but latter it was sold to BMW in the late 1950s.



THE MOST IMPORTANT CITY CAR COMPANY NOWADAYS:
SMART is making cars for urban using. The company became with the cooperation of Mercedes and Chrysler.



ITALY'S ANSWER TO SMART:
MARANELLO 4CYCLE give an alternative answer to the urban traffic problems.

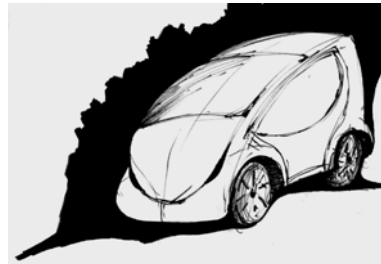
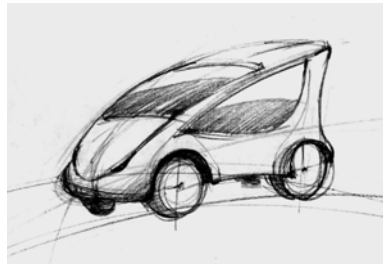
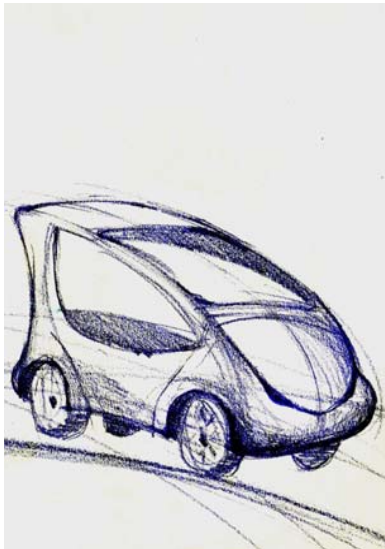


OTHER CITY CARS:
MERCEDES URBAN CAR (1982)
BONETTO DESIGN MIKI (1997)
NISSAN EFFIS (2003)
RENAULT ZOOM (1992)

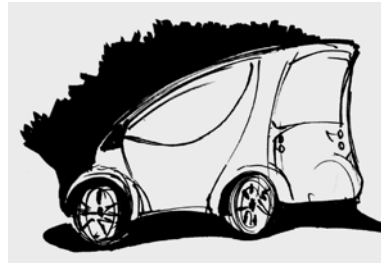
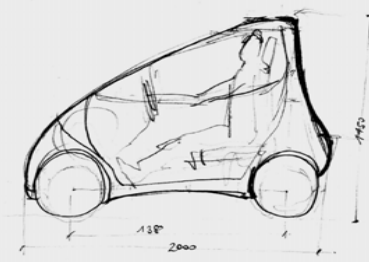
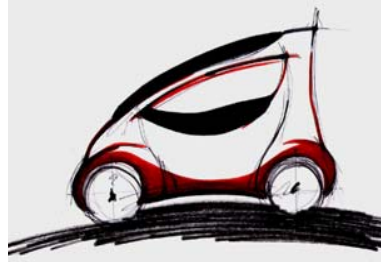
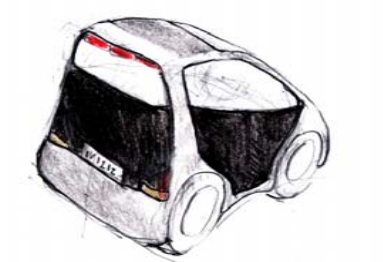
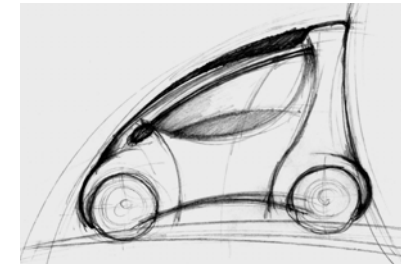
2005 Design of Eco City Car

02 Form Seeking: First Sketches

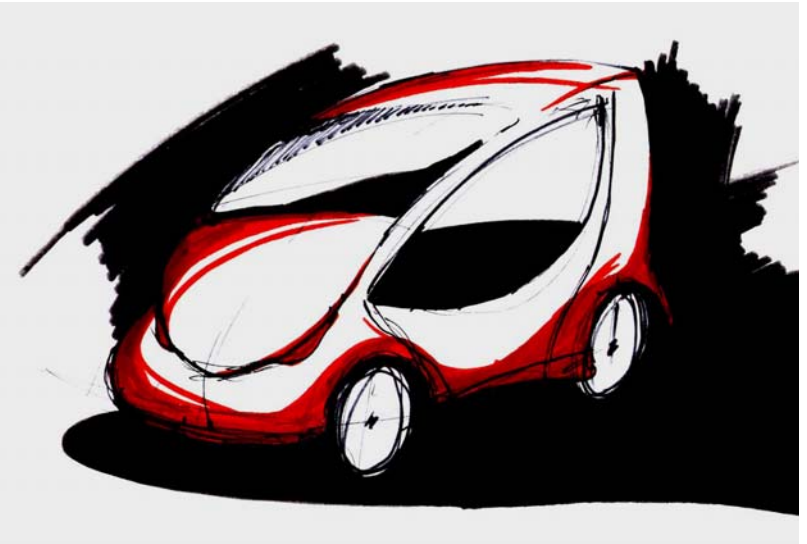
Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



THE FIRST SKETCHES ABOUT SIDE VIEW AND SECTION are reflecting very well the simplicity of the form.



THE PROSPECTS, was made from more different view, was helping us to understand more details of the shape.



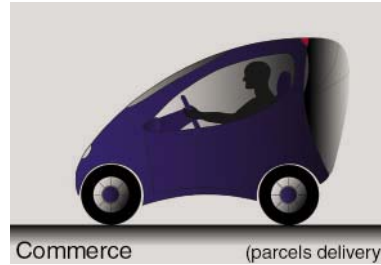
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Services (mobile workshops)



Commerce (parcels delivery)



People mobility (historical city)

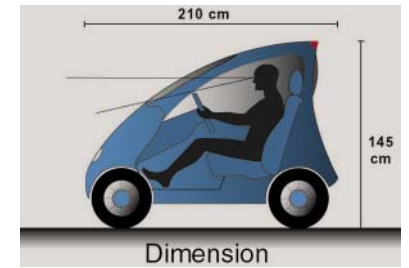
A SMALL HYBRID TWO-SEAT LOW POLLUTION CITY CAR
 A) Efficient power train: Integration of a small I.C. 7 HP engine with an advanced electrical generator able to profitably transform the poor quality electricity produced during low engine regimes. Two compact rare-earth p.m. high-efficiency electric motors directly integrated with the back traction wheels of the vehicle. An electronic differential driving module able to control, during bending trajectories, the required differential speeds of the two back traction wheels.
 B) The utilisation of renewable low-pollution Biofuels like Biodiesel and Bioethanol. Also LPG hydrocarbon fuel will be considered because of its low noxious emission level and its strong existing refuelling infrastructure.

INNOVATIVE ASPECTS

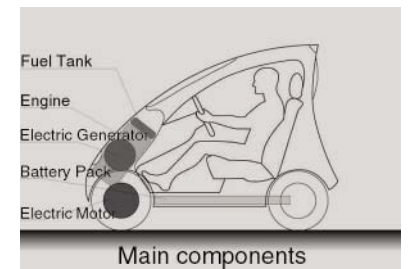
Advanced concept and design. Compact, variable configuration depending on the user requirements. Strong, Lightweight energy absorbent frame and body composite, lightweight windows, biomass fibre panels for interiors etc. Elevated component recycling (~85%) High efficiency electric power train (serie configuration) with rare-earth P.M. disk wheel electric motor and generator - regenerative power system during braking operation - electronic differential system - Metal Hydride battery package - full electronic control and management system - continuous variable speed

MAIN CHARACTERISTICS

- Dimensions: compact but flexible
- Weight: about 400 kg.
- Speed (max.): 50-60 Km/h.
- Autonomy: Electrical operating mode: 50 Km (in town) Biofuel/GPL operating mode: 200 Km (out of town)
- Power train: Battery package: 5 kWh_e
- Emission level: ultra low level



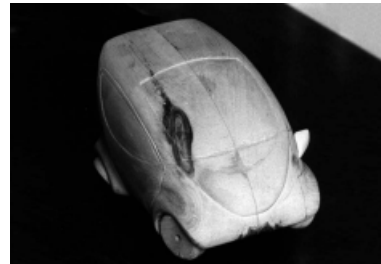
Dimension



Main components

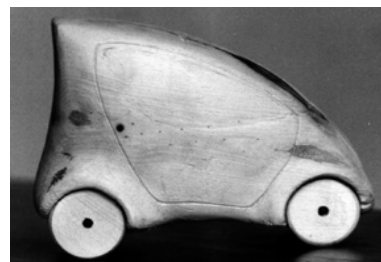
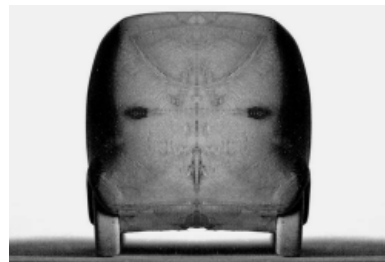
2005 2006 04 Modeling of Clay and Wood Car

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



In the same time with the form and concept definition A CLAY ONE AND AFTER THAT A WOOD 1:5 PROPORTION MODEL WERE MADE to see the car from more prospects, to check and help the design.

'Using models, we can discover the existing problems in design directly, and make the revising scheme and finalize it quickly.' With these models we could make some spectacle model photo and rendering to give an image about our ideas.



2005 05 Life-Sized Model Was Made in China

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



THE "ELECTRIC VEHICLE PROGRAM" OF FIVE RINGS MODEL CLUB QINGDAO, CHINA

According to our usual practice, we will strictly set up the program's executive procedures based on the following development process, and do utmost to make sure every detail of this design can achieve perfection.

The development procedures are as follows:

the preliminary draft of contour design, little 1:5 proportion clay model, 1:1 proportion physical clay model, technical design, sample car, batch production.

During every procedure, we will estimate, inspect, and amend continuously according to the professional standards, so as to reduce unnecessary waste and risks in the process of development, and to make sure this perfect design.

The following will explain each procedure in details:



I. MODEL

This procedure changes the design into a sample car; the clay model verification is an essential step. Using clay model, we can discover the existing problems in design directly, and make the revising scheme and finalize it quickly. The process of clay model verification can be divided into two steps: 1:5 little proportion model and 1:1 proportion physical model.

Purpose: The proportion of the clay model to the real object is 1:1, and it can provide a more accurate and intuitional real object for us. Because the size of the clay model is exactly the same with the real car we can design all the details, the sizes and styles of the components, and confirm the external dimension of the whole car, discuss and confirm all the details of the contour design finally, provide special dimension for internal mechanical design. (Period: 1 month)



2005 2006 06 Prototype Is Being Made in China

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



II. TECHNICAL DESIGN
After confirming the 1:1 clay model, the designer should provide performance parameters for our reference, such as speed, tonnage capability, and continuous driving capability per charge etc. in details. Using our unique technical ability and design method, referring to technology standards of electric vehicles, we will elaborately design, test and optimize every link of the frame system, power drive system, controlling system and components, to guarantee the car processes excellent performance, really exhibit the product's excellent techniques.



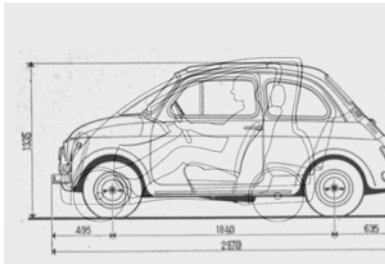
III. SAMPLE CAR
The sample car production reflects every link from the whole car's design to production, reflects our consummate techniques in manufacture, as well as the idea of pursuing perfect in the aspects of workmanship and quality. Its producing course is also a repeated testing course, to test every detail of the whole car, the producing, installing and using processes of its components. After finishing the sample car, it will perform 100 hours, 1200 miles road, and many other related tests which include: rated 1.5 times tonnage capability, battery durability, controller, full-lead, frame impact-resistant capability, and all the performance parameters tests.



IV. BATCH PRODUCTION
After the sample car being confirmed, we would implement small batch production. Classifying 10-20 pieces/time and 30-50 pieces/time. At that time, we would have already set up its own suppliers' network based on original purchasing network, and start operating procedures from purchasing to dispatching from our factory. During this course, the production and inspection departments will strictly set up, perfect and carry out workmanship management and quality management regulations, foresee and settle the probably existing problems in mass production, and carry out final verification of the car's design, performance and quality.

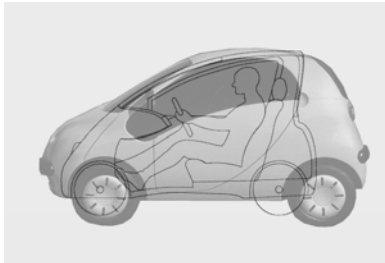
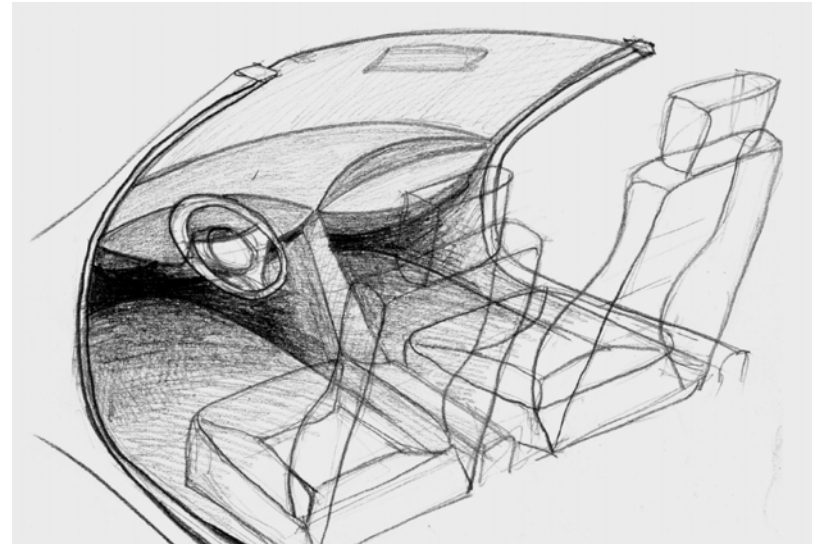
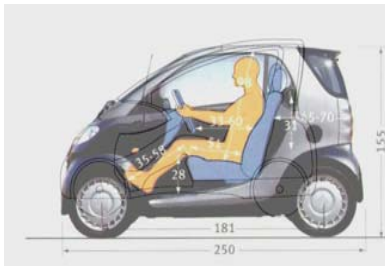
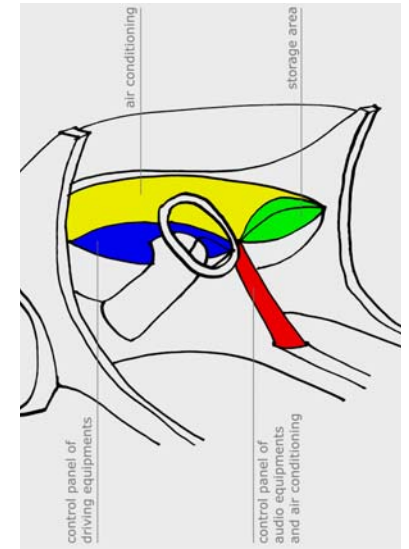
2005 2006 07 In the Studio: Interior Design

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



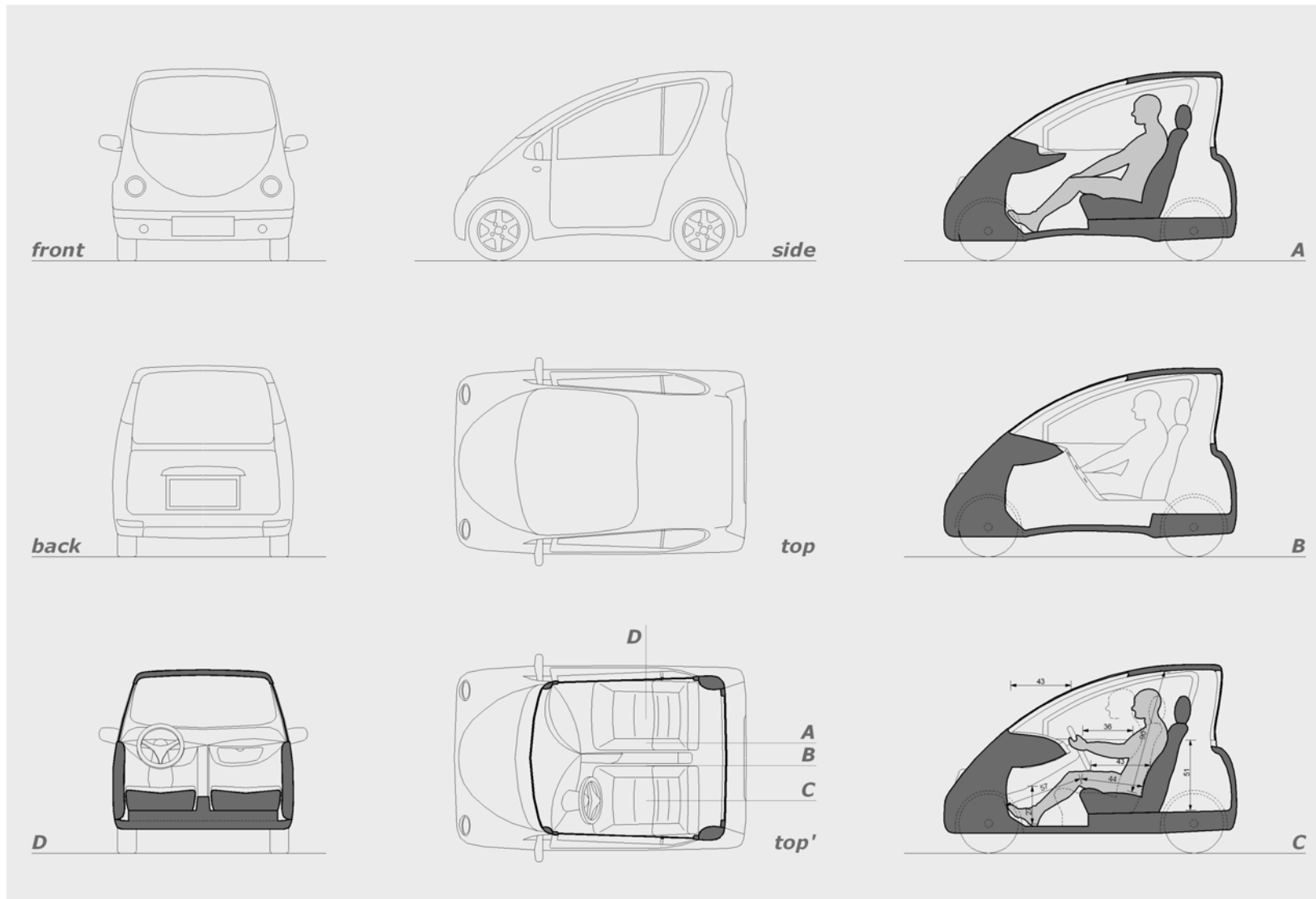
In the phases of technical design we have to make plans about THE CAR INTERIOR and especially about THE DASHBOARD.

We were studying interiors of little cars, and we were comparing our ideas with other solutions all the time during the design. According to our concept there was made a clay model about the dashboard. And we tried to find more different way to give an image about our concept and ideas.



2005 2005 08 Last Drawings of ECO City Car

Designer: MICHELE PICCINI Engineer: MARCO ANDREOZZI



During the whole design and modeling procedure WE HAVE BEEN MAKING DRAWINGS to follow the results of them and to suggest newer changes.

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MICHELE PICCINI
Engineer:
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David Chiamonti
Jea Woo Kim
Pietro Piccini
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Tânia Raposeiro
Farkas Mária Magdolna
Horváth Tamás
DIM Digital Imaging