APMS 2010
Massimo Mattucci
Comau SpA
Cernobbio, October 11, 2010
Agenda

- **COMAU** CORPORATE PROFILE
- **FIAT GROUP SUSTAINABILITY TARGETS**
- **eCOMAU**: ENERGY EFFICIENCY SOLUTIONS
- **EN 16001**: COMAU APPROACH
- **CECIMO (SRI)**: ENERGY EFFICIENCY WORKING GROUP
COMAU CORPORATE PROFILE
Our Mission

COMAU IS A **GLOBAL** AND **INNOVATIVE** PROVIDER OF SUSTAINABLE AUTOMATION AND SERVICE SOLUTIONS

MARKET IS THE AUTOMOTIVE SECTOR AND OTHER INDUSTRIES REQUIRING PROCESS AUTOMATION SOLUTIONS

BASED UPON COMAU TECHNOLOGICAL KNOW-HOW AND EXPERIENCE
Our Distinctive Strategy

- **HIGH COMPETENCE** to cover a wide range of key technologies
- **FULL INTEGRATED CAPABILITY** in product, process and service solutions
- **GLOBAL**
  - A network of 23 operative centers located in 14 countries, led by global processes
  - 60% resources in BRIC countries
  - Global project management system based on PMI® standards, customized on local market needs and cultures

- **SOLUTION ORIENTED**
- **INNOVATIVE**
- **HIGH DENSITY AUTOMATION** cells to tune and optimize investments
- **ENERGY SAVING** products and services solutions
- **LEAN PRODUCTION APPROACH**
Core Competence

BODY WELDING
FINAL ASSEMBLY

METAL CUTTING
ASSEMBLY & TEST

LASER WELDING
ARC WELDING

SEALING
DRILLING & RIVETING
Multi Technology Competence

BODY SHOP TECHNOLOGIES

POWERTRAIN MACHINING & ASSEMBLY

FINAL ASSEMBLY SYSTEMS

ROBOTICS & AUTOMATION

MAINTENANCE SERVICES
1 out of every 3 vehicles in the world, over 20 million annually, are manufactured with Comau technology.

Automotive

Aerospace

Automatic drilling and riveting for Joint Strike Fighter with Northrop Grumman.

Energy

Solar cells manufacturing process with Boeing.

Service

Highest market share in industrial maintenance services in Brazil, from automotive to diversified general industry.
ONE TEAM

OVER 35 YEARS OF EXPERIENCE

3 RESEARCH & DEVELOPMENT CENTERS

14 MANUFACTURING PLANTS

23 DIFFERENT LOCATIONS

14 COUNTRIES

84 PMI® CERTIFIED PROJECT MANAGERS

11,700 EMPLOYEES WORLDWIDE

7,900 EMPLOYEES IN EMERGING COUNTRIES
A year of Sustainability: Facts and Figures

- Fiat S.p.A. enters Dow Jones World and Stoxx Sustainability Indexes.
- For the third year running, Fiat is named leader for the lowest CO₂ emissions in Europe at 127.8 g/km.
- Centro Ricerche Fiat: Patents filed for 29 inventions and approximately 360 new patents obtained worldwide.
- The nominating and corporate governance committee is assigned responsibility for sustainability issues.
- Fiat S.p.A. receives special mention as Sam Gold Class and Sam Sector Mover.
- The group's sustainability internet site named best improver in Italy at CSR Online Award.
- €1.7 billion spent on research and development with 14,000 people located in 17 R&D centres.
- Multiair presented on Alfa Mito and Fiat Punto EVO: -10% CO₂ emissions.
- 123 ISO 14001 environmental certifications.
A year of Sustainability: Facts and Figures

- **11% of Energy**: Consumed by the Group is from Renewable Sources

- **-12.6% Over 2008**: CO₂ emissions per vehicle produced at Fiat Group Automobiles plants worldwide

- **ABS SUPERSTEER™**: From New Holland awarded Silver Medal for Innovation

- **€21.8 Million Committed**: By the Group to local communities: +16% over 2008

- **-9.7% Over 2008**: In water consumed per vehicle produced at Fiat Group Automobiles plants worldwide

- **For the Aprvoce Da Vida Project, Fiat Wins Award in Brazil for Best Company in the Management of Social and Environmental Responsibility**

- **2,150 Youth Trained Through TECHPRO² Project**

- **431,000 Hours of Training to the Network on Safety and the Environment**: +80% over 2008

- **€225 Million spent on Health and Safety in the Workplace**

- **91% of the Value of Direct Materials Purchased by Fiat Group Automobiles Comes From ISO 14001 Certified Suppliers Sites**
Fiat Group Sustainability Main Targets

EN 16001
All Fiat Group Plants

Certification of Energy Management System
EN 16001

Waste Management improvement

Mapping of plants for external noise & water availability

Energy & Environment Key Performance Indicator compliance

Reduction plan for energy consumption and CO2 production

ISO 14001
All Fiat Group Plants

Certification of Environment Management System
ISO 14001

Biodiversity Conservation

ISO 14001
All Fiat Group Plants

Action plan
Fiat Group Sustainability - Energy Consumption

Target

2014: -15% vs 2009 in energy consumption and CO2 emissions per unit values at every Group Sector

Note: for detail by Sector, go to http://sustainability.fiatgroup.com/
ENERGY-EFFICIENT INDUSTRIAL SOLUTIONS
Green Automation Consulting

COMAU DEVOTES SIGNIFICANT RESOURCES TO TURN THE GREEN-COMMITMENT AND ENVIRONMENTAL RESPONSIBILITY INTO REAL ENERGY SAVING RESULTS

DEVELOPING SHORT-TIME PAY-BACK GREEN AUTOMATION SOLUTIONS IN MATERIAL HANDLING, WELDING, METAL CUTTING AND ASSEMBLY SYSTEMS

COMAU ALSO OFFERS GREEN-FIT CONSULTANCY ON EXHISTING MANUFACTURING SYSTEMS
**Industrial Energy Efficiency Team**

- Industrial Energy Managers
- Product / Process Experts focused on Design for Sustainability, GreenFit, Life Cycle Cost Analysis

**Energy Efficiency Service Team**

- Team dedicated on achieving energy targets/objects on shop floor
- Skilled on Energy Efficiency Parameters, Method and Action Plan execution

**Eco Products & Technologies**

- **“Plug & Save Solutions”**
  - Comau Robotics: New Robot generation
  - Comau Powertrain: Smart Drive
  - Comau BWA: Versaroll

- **Consulting**
  - Team dedicated on achieving energy targets/objects on shop floor
  - Skilled on Energy Efficiency Parameters, Method and Action Plan execution
Eco-innovation as driver of sustainable manufacturing

**Eco-innovation targets**

- Institutions
- Organisations
- Marketing methods
- Processes
- Products

**Modification**

- Eco-efficiency
- Cleaner production
- Pollution control

**Re-design**

- Industrial ecology
- Closed-loop production
- Life-cycle thinking

**Alternatives**

- Eco-innovation mechanisms

**Creation**

- Phase 1
- Phase 2

October 11, 2010

Property of Comau S.p.A. - Duplication prohibited
CASE STUDIES
Organized in 7 Chapters

1. Motor & Drives
2. Hydraulic System
3. Air System
4. Cooling System Control Cabinet
5. Power Electronics
6. Peripheral Devices
7. Controls

47 check-list points, as potential improvements

For each potential improvements and for each assessment subject, eComau Team investigates feasibility and applicability, proposing to the Customer a list of GREENFIT IMPROVEMENTS

Cost of intervention (Euro), Saving (%), Pay-Back (years)
to be agreed, based upon time, technical requirements, energy cost data
GreenFit by Comau Powertrain

Monitored period: **Power** – 17%  **Air** – 22%  **Coolant** – 29%

Standby mode: **Power** – 77%  **Air** – 48%  **Coolant** – 100%

Monitoring and Results validation

Intervention definition and site implementation
COMAU Robot C4G: Energy-Efficient Solutions

REP (Robot Energy Package)

- **KERS**
  Capacitors module accumulating the kinematics energy during robot arms deceleration phase

- **Fan control optimization**
  Fan speed reduction module when the robot is in stand-by or in drive-off

- **Stand-by optimization time**

- **Shut-off valve management** (via SW management)
EN 16001: COMAU APPROACH
Why EN 16001

- To implement a certified Energy Management System (EnMS)
- To develop a policy which take into account legal requirements and information about significant energy aspects
- To build and maintain systems and processes necessary to improve energy efficiency
- To reinforce the ISO 14001: 2004 Environmental Management System (Comau already certified on most locations)
- To avoid “Green washing”

Energy Management certifications

- EN 16001: 2009
  - European standard reference
  - Released: July 2009
- ISO 50001
  - Worldwide standard
  - Proposed to replace the EN 16001 being fully compliant
  - Estimated release: May 2011
R&D PROJECTS
The Eco-Factory: the research approach
Factories of the Future (FoF): The Eco-Factory

Cleaner and more resource-efficient eco-factory aiming at increasing the overall efficiency of production systems by reducing the use of resources and energy, as well as emissions, waste treatment and recycling

- An integrated and holistic approach is proposed for
  - developing process simulation optimization methodologies
  - reducing global resources consumption
  - preventing environmental pollution
Factories of the Future - Plant Cockpit

<table>
<thead>
<tr>
<th>Title: PlantCockpit Production logistics and sustainability cockpit</th>
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<tr>
<td>BU involved: PWT France</td>
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<td>Funding Agency: European Commission - FP7-2010-NMP-ICT-FoF</td>
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<td>Funding Scheme: Large-scale Integrating Project (CP-IP)</td>
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<td>Main Objectives: Study of a central environment for monitoring and control of all intra-logistical processes. Production supervisors, foremen and line managers will have the required visibility to make well-informed decisions for optimizing plant processes. This includes the holistic visibility of the plant, the current status, deviations and exceptions, and bottlenecks.</td>
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| Expected Results: Integrated heterogeneous, multi-vendor system landscapes including ERP, MES, SCADA, condition-based maintenance, energy management, and other special-purpose systems. The project will impact on:  
  - delays of internal to external supply;  
  - optimized purchasing processes;  
  - better energy/resources management  
  - overall efficiency of processes |
| Timetable: 2010 - 2012 (36 months) |
| Partners: SAP (DE), COMAU (IT), Acciona (ES), BMW (DE), Doehler (NL), EPFL (CH), Fatronik (ES), Iconics (CR), Intel (ER), TUT (FI), UniDresden (DE) |