

Robots for sustainable &
human friendly manufacturing



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Robots for sustainable &
human friendly manufacturing

CETIM



French Mechanics Technical Center

IDENTITY

Mechanics, the source of life and civilisation



*Any material object is built from
mechanical intervention*

650,000 employees, 1st industrial employer

B€97,9 of turnover with almost **39%** concerning
export

11,000 companies with more than 10 employees

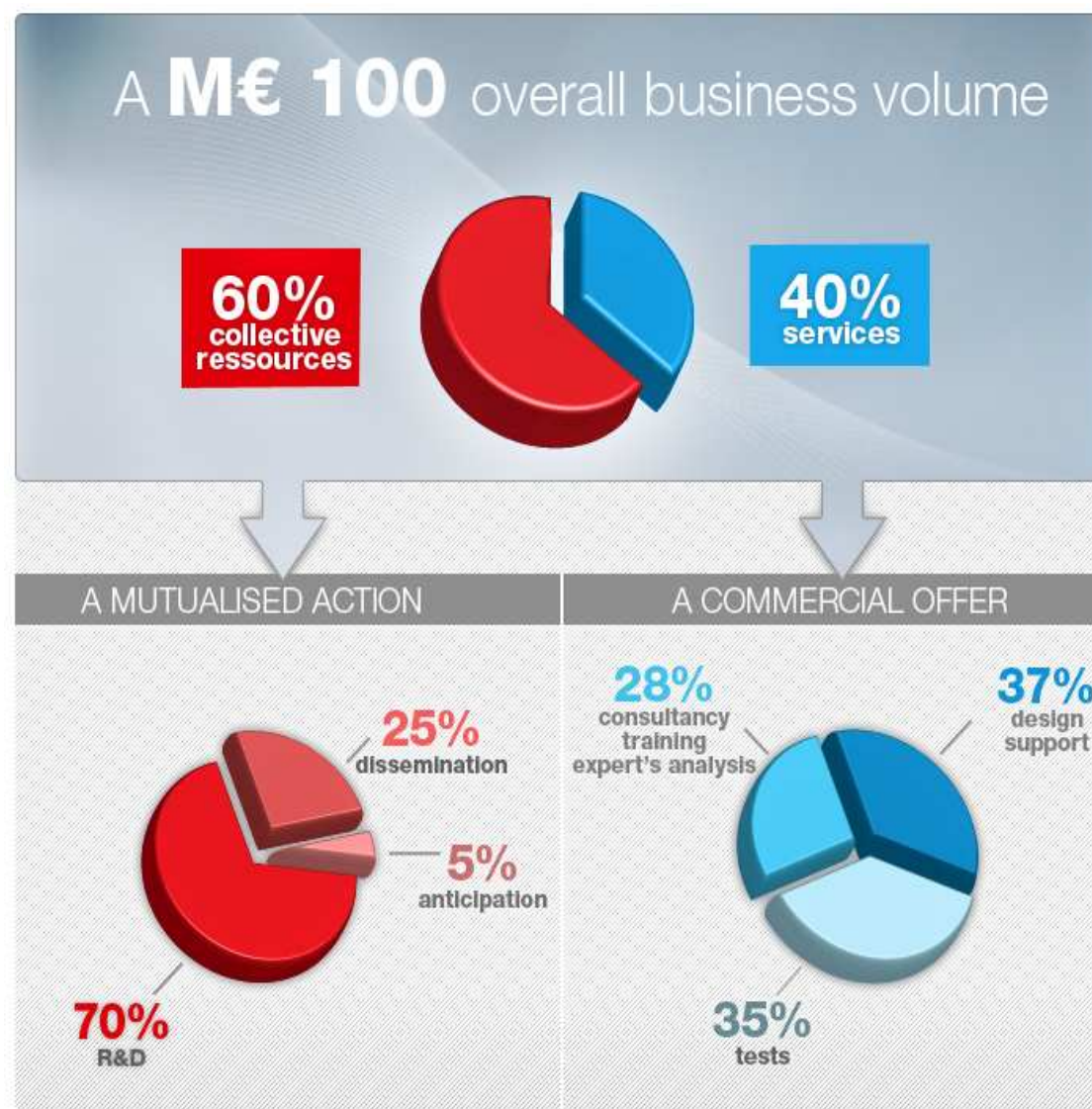
IDENTITY



Governed by Articles
L342.1 to L342.13
of the Code of Research

Technological institute of mechanics

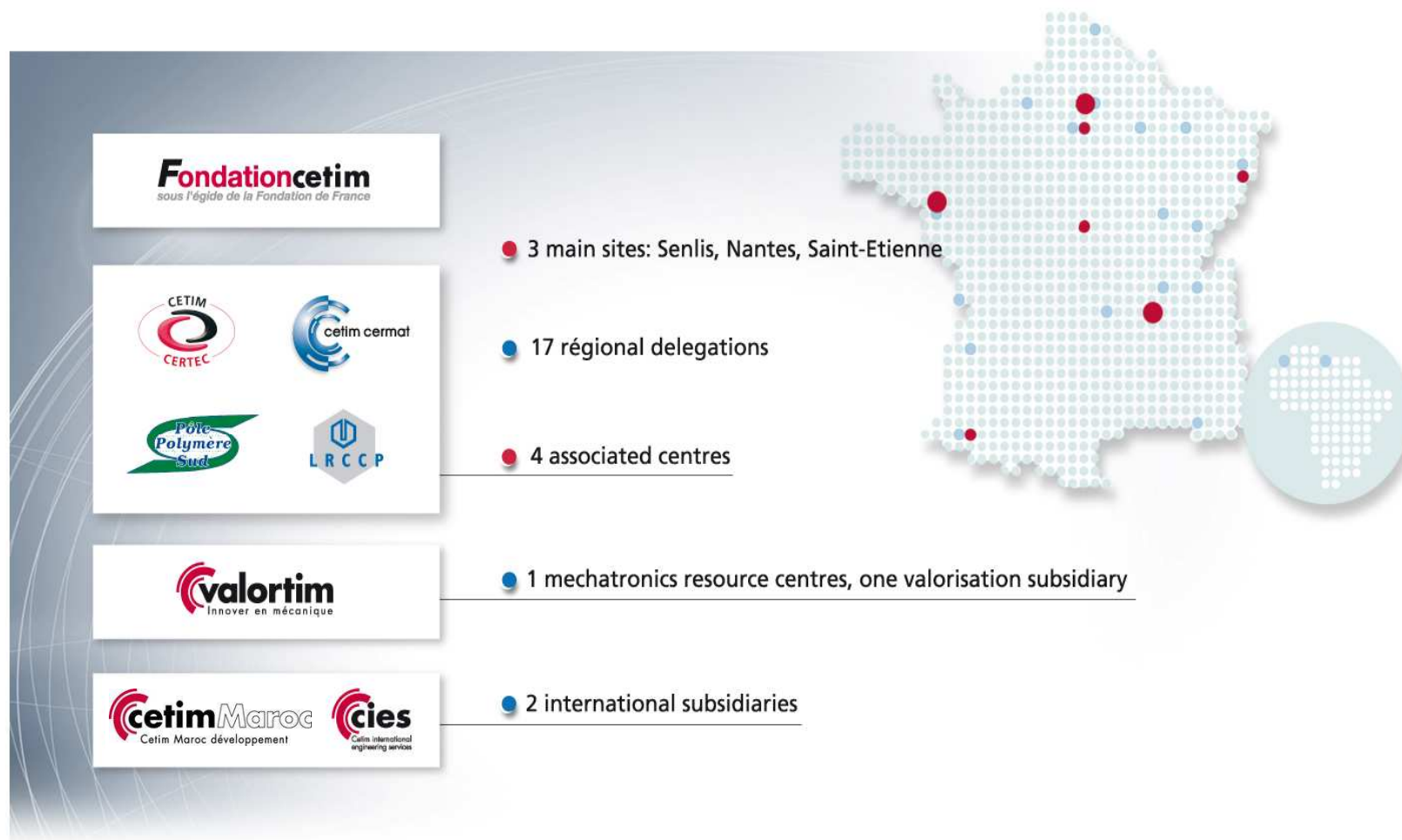
Steered by mechanical industrialists under the State's supervision



IDENTITY

A regional, national, international actor

The French mechanical centre close to its 7,500 subscribing companies



A mutualised action

- Supporting the trades of mechanic
- Making technological choices for the future
- Developing synergy with Research
- Accompanying Small and Medium size companies
- Innovating: in the heart of strategy
- Dissemination and Technology transfer



IDENTITY

Supporting the trades of mechanic

Steering for and by industrialists

1 scientific and technical committee defines the R&D directions

An organisation open to all subscribing mechanical sector

7 Programme committees gathering
30 professional commissions accessible to all subscribers

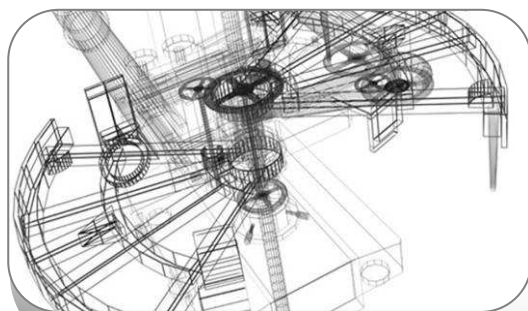
The support of mechanic interests the with mechanic standardisation Union

205 Seats in standardisation committees working groups

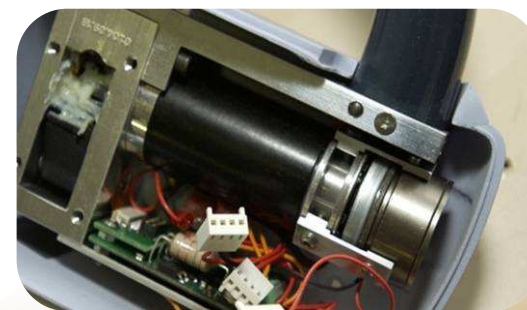


A
MUTUALISED
ACTION

Making technological choices for the future



**Design Simulation
Tests**



**Mechatronics
Inspection
Measurement**



**Materials -
Processes**



**Sustainable
development**

Priorities



A MUTUALISED ACTION

Making technological choices for the future

Platforms to speed up developments

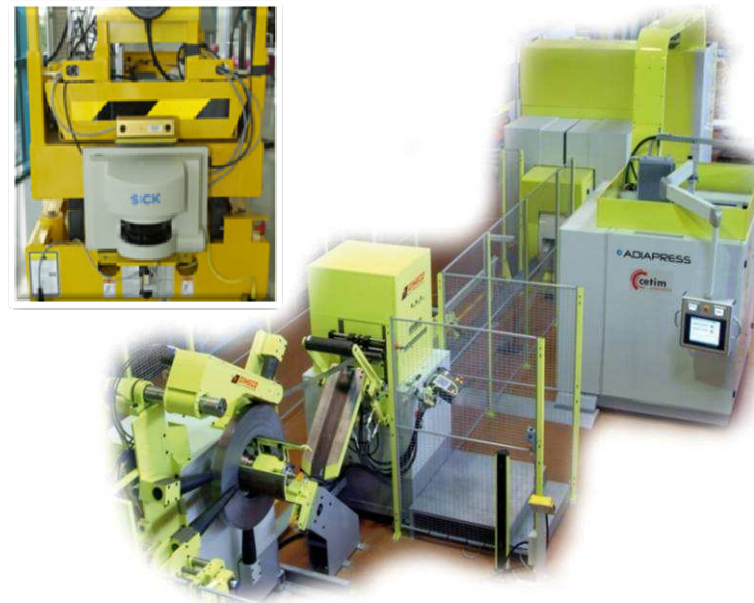
- Mechatronics



- Innovative manufacturing processes



- Composite materials



A MUTUALISED ACTION

Developing the synergy with Research

The « Carnot » network to enlarge the scope of R&D and favour partnership research



A foundation to lift scientific and technological obstacles



7 common laboratories with universities and the CNRS so as to associate scientific research and technological innovation

*TGV tribology bench
developed in the scope of
the common Mecatrib
laboratory
(Cetim/Supmeca)*



A
MUTUALISED
ACTION

Accompanying small and medium companies

An on-site technological support

Mechanics Mondays

Support for project development

Regional assistance

more than 40 % of the 7,500 subscribers contact the Cetim every year

A proximity support

Technological and strategy support
collective regional actions

more than 800 companies,
M€ 5 of funding to the benefit
of small and business companies
every year

Steering of regional mechanics
committees

7 active committees

A
MUTUALISED
ACTION

Accompanying small and medium companies



A national and international networking

Active participation
in regional competitiveness clusters

32 projects in **17**
clusters

Steering of Mechanical oriented National
technology platform linked with european
technology platform



Preparation of ambitious multiregional
programmes associating the integration
of the local situation and the mutualisation
in the service of industrial development



600 small and business companies
involved in **18** regions



A MUTUALISED ACTION

Innovating: in the heart of strategy

Innovating project support

Project preparation, design support, industrialisation

Co-developments

Risk sharing
(return in the form of royalties)

6 patents

Engine for internal dynamics

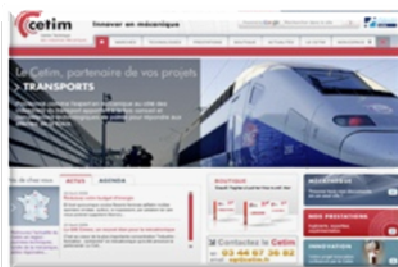
17 invention reports



A MUTUALISED ACTION

Transmitting and informing

Permanent access



23,000 visitors
everymonth



15 technical days
60 mechanical



2 international
congresses



800 participants to
flash Midest lectures



More than calls/year

30 new performance reports
10 new issues/year
Catalogues: Training, Publishing, Software
Annual report - **Cetiminfos**

Robots for sustainable &
human friendly manufacturing

Robotcaliser

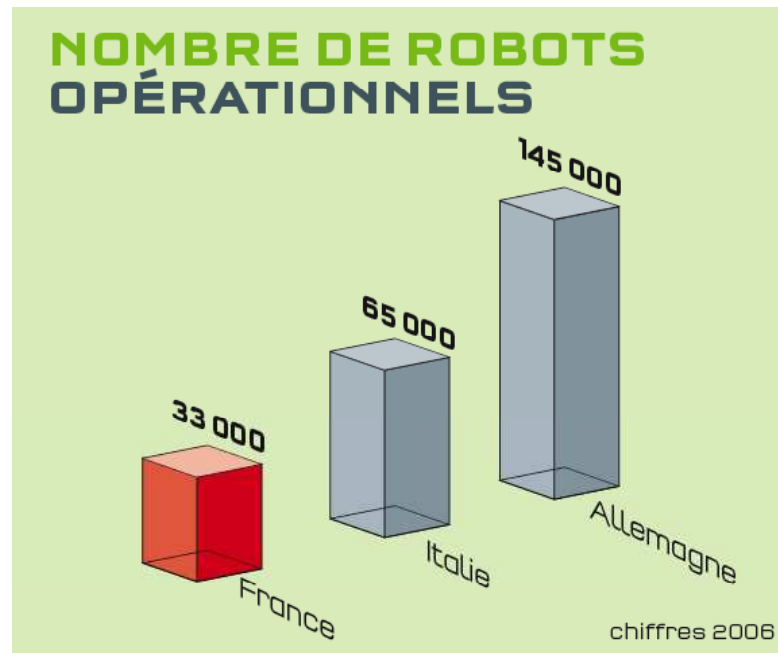


Robotiser pour ne pas délocaliser !

ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

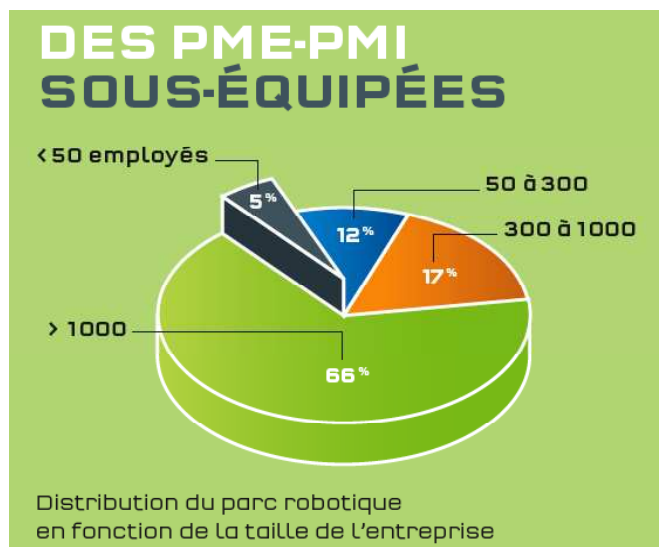
Quand les chiffres parlent d'eux-mêmes...

Aujourd'hui : + d' 1 000 000 robots industriels opérationnels dans le monde



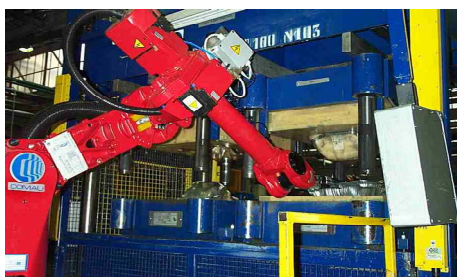
ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

Quand les chiffres parlent d'eux-mêmes...



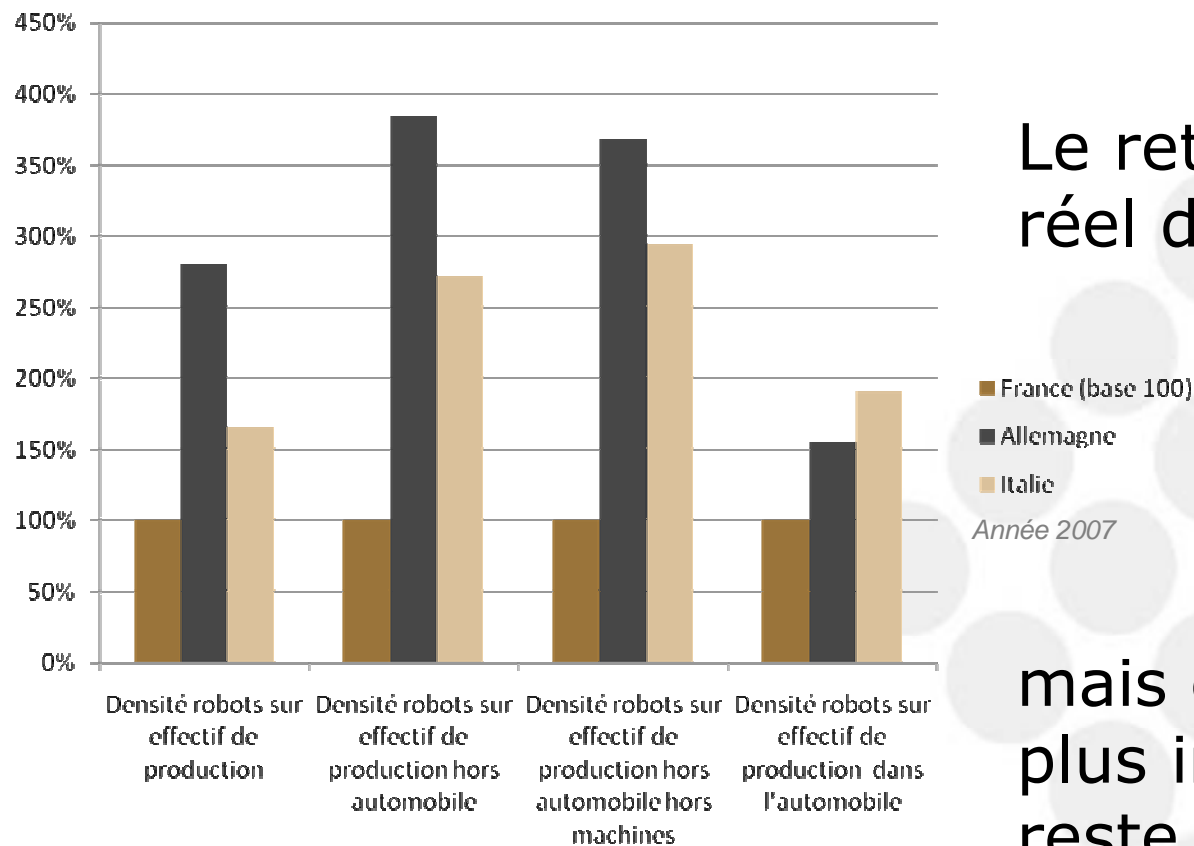
« L'écart avec nos voisins s'amplifie chaque année: lorsque nous équipons nos ateliers de 4 000 robots par an, les industriels italiens et allemands en intègrent respectivement 6 500 et 16 000. »

Hervé Novelli,
Secrétaire d'État
chargé des entreprises
et du commerce extérieur.



ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

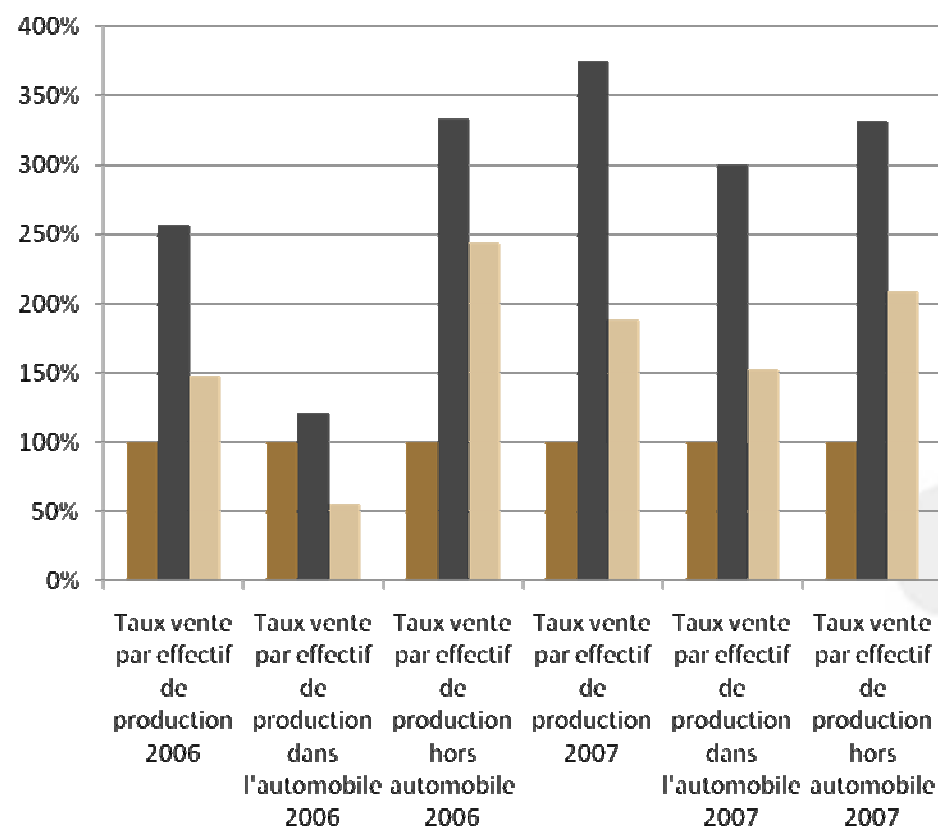
Une densité très faible par rapport à l'Allemagne et l'Italie



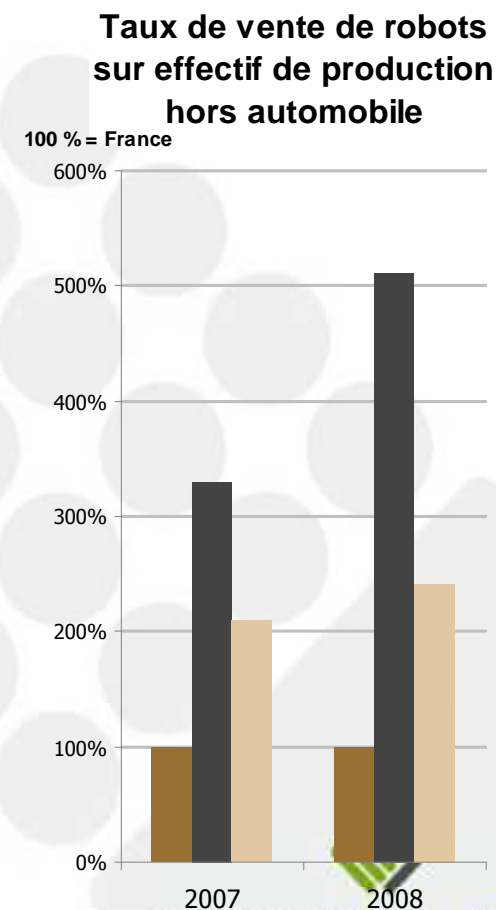
Source : analyse Nodal d'après données IFR World Robotics 2008

ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

Des installations encore moins nombreuses en 2007 par rapport à l'Allemagne et l'Italie. L'écart se creuse...



Le retard s'est accentué en 2008...

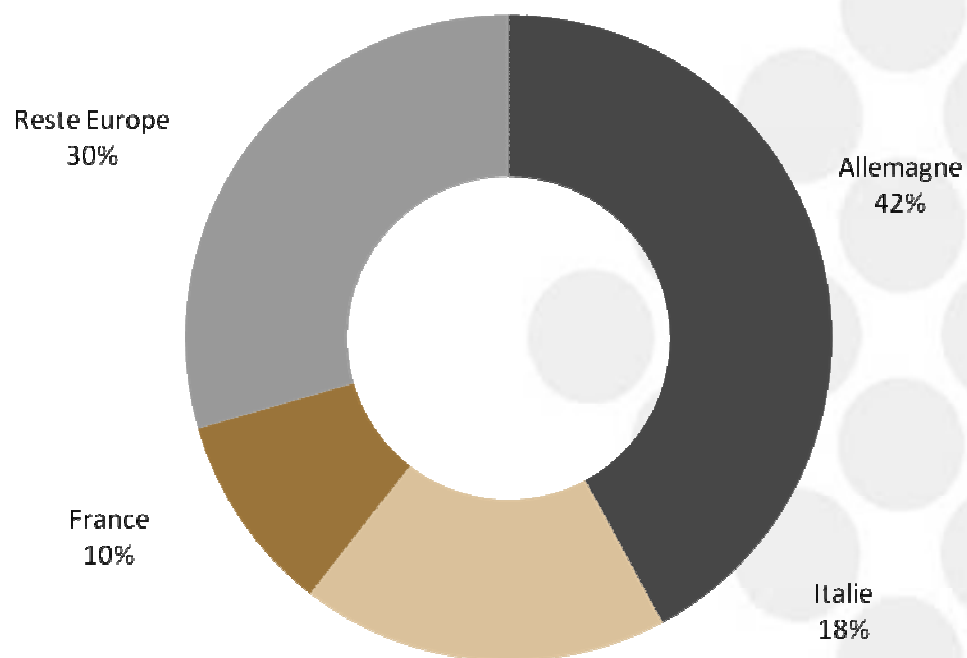


Source : analyse Nodal d'après données IFR World Robotics 2008

ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

La France est sous-équipée

Parc de robots en Europe en 2008
(source: IFR)



ROBOTCALISER : UNE ALTERNATIVE SÉRIEUSE À LA DÉLOCALISATION

Conclusion:

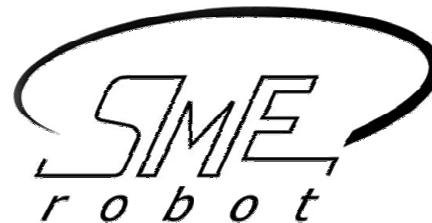
DELOCALISER N'EST PAS LA SEULE ISSUE !

OSONS - OSEZ !
penser et essayer autre chose

AUTOMATISER – ROBOTISER

www.robotcaliser.com
www.symop.com

CETIM in SMERobot



The European Robot Initiative for
Strengthening the Competitiveness of
SMEs in Manufacturing

A vision of robotics potential in SMEs and French industry



The SMERobot Initiative

Research & Development

Robot capable of understanding human-like instructions

Safe and productive human-aware space-sharing robot

Three-day-deployable integrated robot system (install-configure-instruct)

Demonstrations (Focus)



Intuitive instruction of fettling of castings for the foundry



Fast installation, small batch size production change (forgery)



The SME welding robot



Automation of manual woodworking processes

Innovation Related Activities

- Training and education
- Socio-economics (new business models, LCC)
- Standardization
- Exploitation, IPR

Robots for sustainable &
human friendly manufacturing

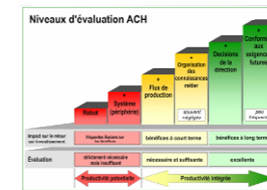
Cetim SMERobot activities in France

Cetim in SMERobot to promote :

- Safety standard for collaborative robots
- Robotics in and for SMEs
- Innovative use cases in France

Our generic approach

- Disseminate “SMERobot” innovation message
- Understand SME’s position regarding robotics
- Identify key requirements and appropriate solutions for “in-situ” robotization
- Follow-up of potential applications



SYMOP

ROBOTCALISER



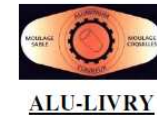
SMErobot Dissemination in france

20 SMEs and integrators interviewed for “Opportunity Assessment” in Industrial processes related to demonstrators (Casting, Assembly, Welding, Composite Machining,)

2009 Dissemination event in Senlis (70 p.)

2010 SMErobot dissemination

- Lundi de la mécanique with SYMOP (200 p.)
- Robotics platform in region Prox'INNOV (20p.)
- ACR : Franche Comté, Bretagne, ... (20p.)



Attitude of encountered SMEs & Industrials regarding robotics

First reasons given for robotization by SMEs

- Working conditions, H&S
- Repeatable quality
- Lack of qualified manpower
- Productivity comes often in a second step

Some SMEs think and implement automation by themselves. They develop and manage these skills as key competences for their mfg processes

Conventional view of industrial robotics and ROI approach has been a frozen factor for robotics projects

Robot without fences more needed than collaborative robot



Robots for sustainable &
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Lessons learned from SMERobot dissemination

French SMEs are open to robotics

Leading edge SMEs willing to develop robotics as a core competence

SMERobot message is a mind opener for large companies

When known new technologies and regulation evolutions enable new solutions and usage for industrial robotics

Design of solutions and ROI calculation more and more understood as to be driven by future challenges of the SME



Social pressure & Industrial challenges

An opportunity for robotics in France

Robots for sustainable &
human friendly manufacturing

Industrial question to robotics shifts from mass production to discrete manufacturing



- < once/**year**
- “offline”
- ~4*robot unit price
- ~5% of installations
- Trained staff

Changeover
Programming
Workcell cost
Sensor equipped
Maintenance

- < once/**day**
- “on-line”, shop-floor
- <<4*robot unit price
- 100%
- Worker

Robots for sustainable &
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Perception of painful job drives to a lack of workforce



Robots for sustainable &
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Musculo skeletal disorders are tracked as cost inducer for social insurance bodies



Robots for sustainable &
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Senior and women employment becomes a requirement for work stations' ergonomics



Robots for sustainable &
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Large dimensions mfg processes demand of flexible, easy to use with low Capital & Operational expenditure systems



Integration challenges

How does innovative exploitation of existing robots concepts and technologies may tackles industrial and societal requirements ?

Main trends combining existing technologies

Ease of use

- Robots without fences
- Collaborative robots
- Ability to reproduce complex hardworking patterns
- “Even more” user friendly interface

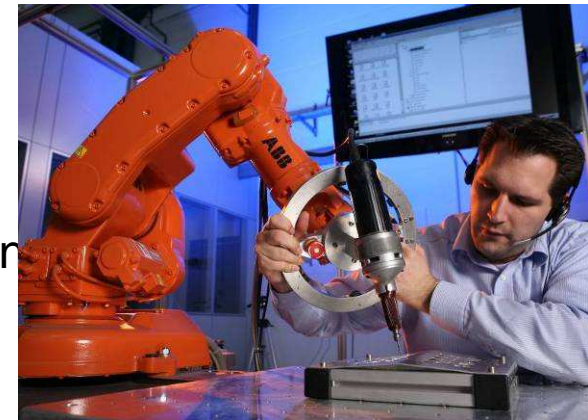
Reduce Setup time

- Programming by learning
- Programming from CAD data
- Automatic sensing

Plug and produce systems

- Interconnectivity of component and systems
- Standardization

Cost reduction



Robotics challenges

How does innovative robotics concepts and technologies may enhance comfort and performance of man at work ?

Demand for new concepts

Enhance the man's hand capacity

- Power assistance : gesture assistance
- Accuracy assistance

New architectures for industrial robot systems

- Large part manufacturing solutions
- Combine process performance and safety (beyond work pace)

Ease of use

- Result oriented programming & controlling
- Auto-Learning by experience

Mobility

- Appropriate ability at the right place at right moment.
- Mobility on external working area (building site)



Thank you for your attention

jean-yves.benaiteau@cetim.fr