The European Association of the Machine Tool Industries

Message from the industry to public authorities: “ *We need an European strategy to support AM*”

EMO MILANO

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Main sectors of AM applications

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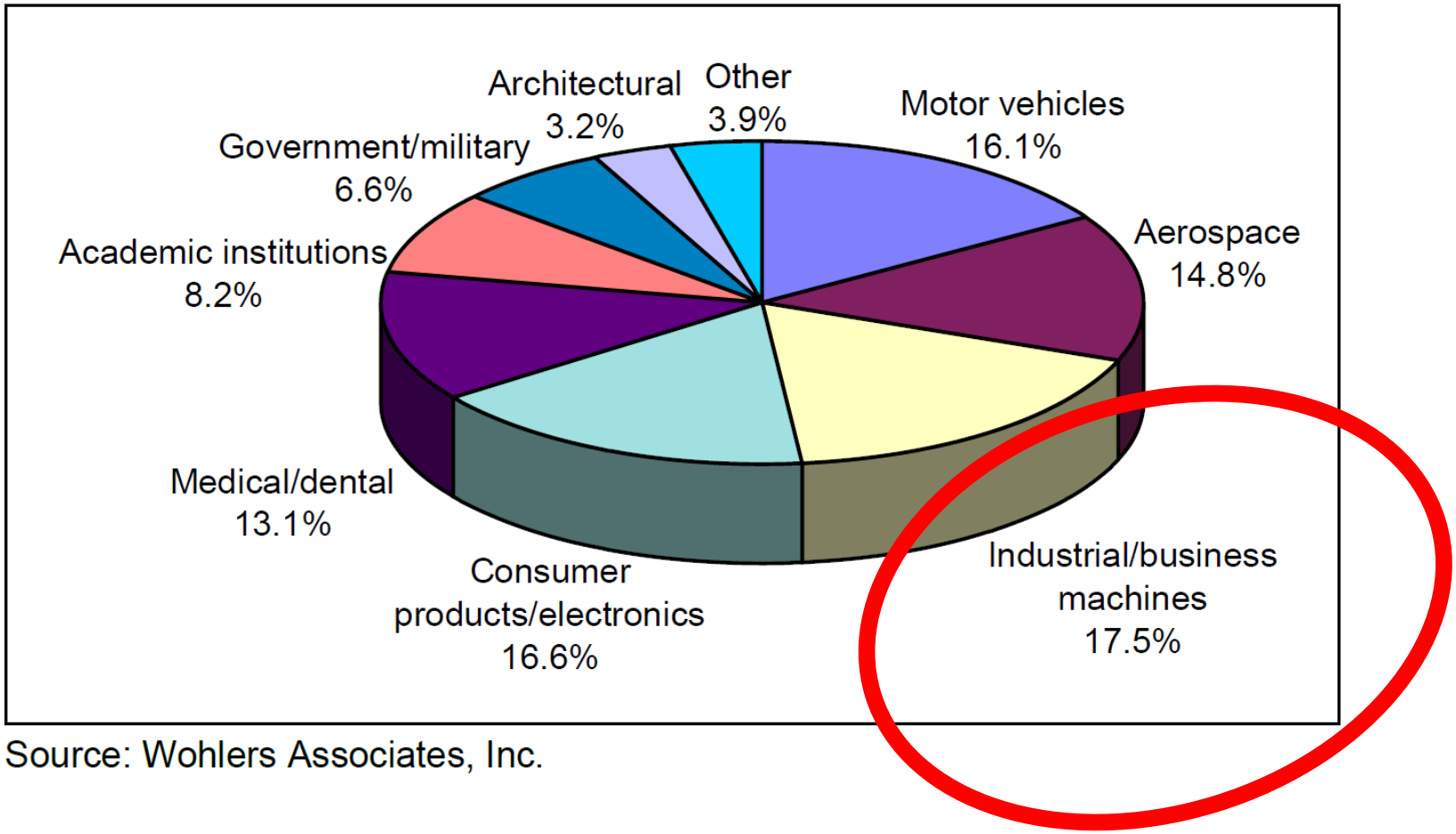


Source: Wohlers Associates, Inc.

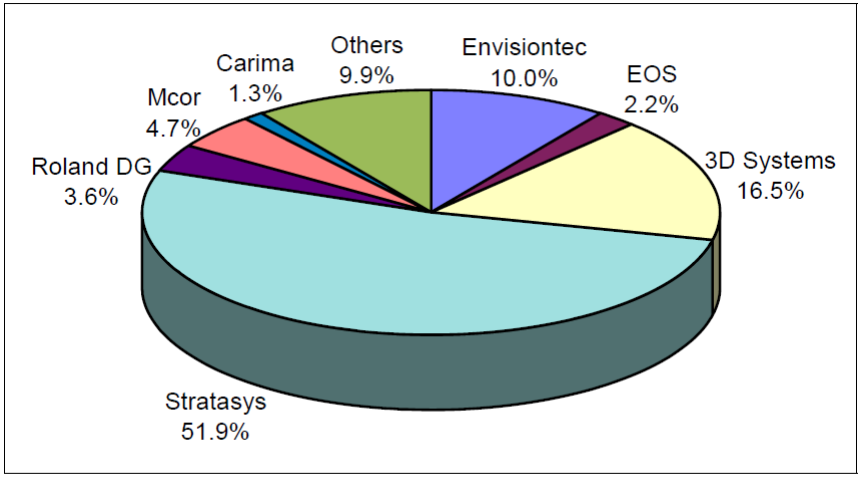
Sources : CECIMO, Roland Berger

Additive Manufacturing and Machine Tooling: Market shares

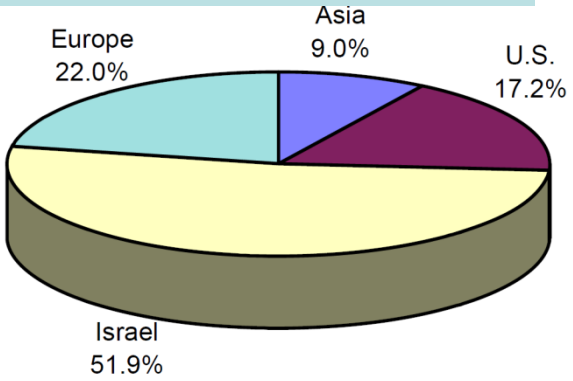
This group is the leading industrial sector in AM applications. its share was 17.5 % in 2014

Stratasys sold 6,665 industrial AM systems in 2014 (excluding 3D printers and achieving the 51.4% of the market, while leading the market for the 13th consecutive year and notwithstanding a decrease from the previous 54.7%.

- **3D Systems - US**
- **EnvisionTEC – Germany**
- **Mcor - Ireland**
- **EOS – Germany**
- **Carima – South Korea**



Source: Wohlers Associates, Inc.



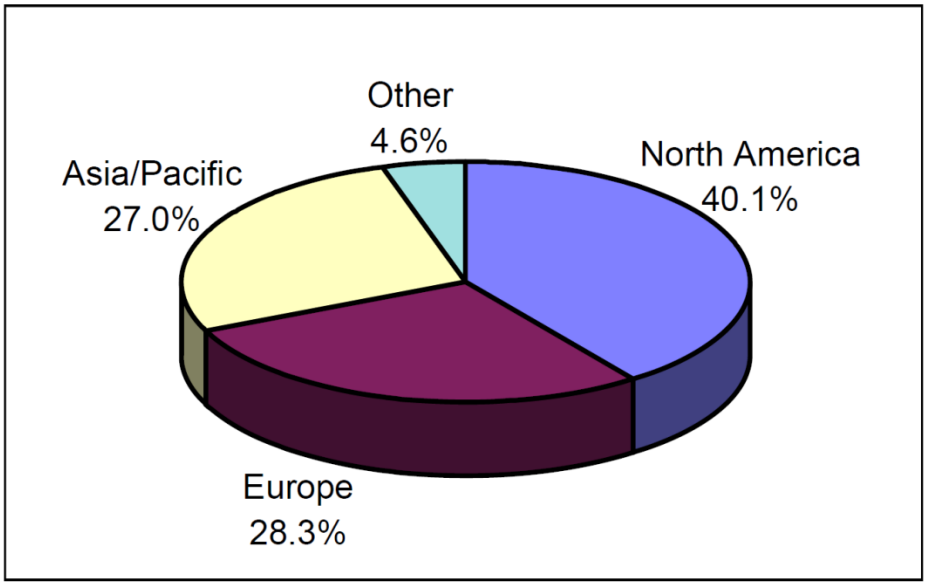
Source: Wohlers Associates, Inc.

Interesting noting that since 2012 the US are not leading the market any more in terms of production and sales, due to the merging between Stratasys and Object and the consequent registration of the new legal entity in Israel.

Additive Manufacturing
Industrial systems installed worldwide

PER REGION

North America is leading in terms of industrial AM installations, while Europe and Asia are almost sharing equal percentages



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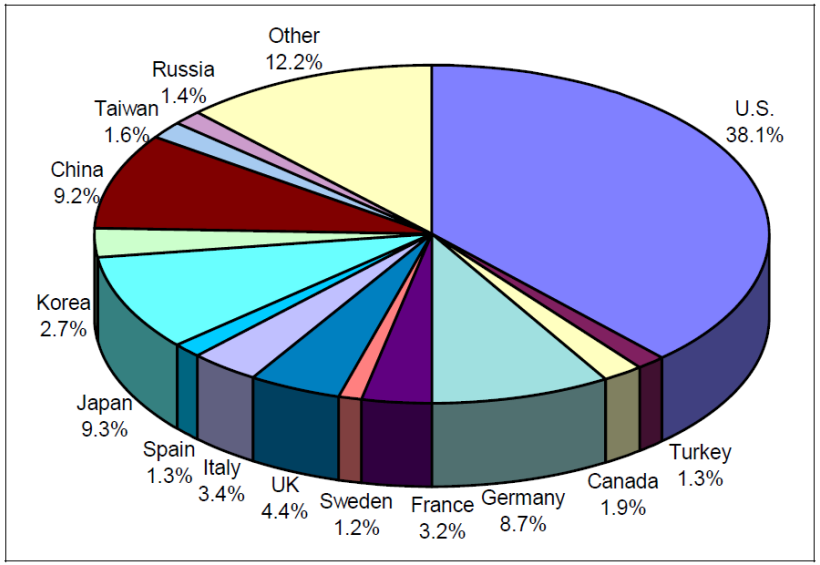


Source: Wohlers Associates, Inc.

PER COUNTRY

United States is leading in terms of industrial AM installations, followed by Japan and China.

In Europe, Germany, Uk Italy and France are in the forefront.

GOVERNMENT SUPPORT TO ADDITIVE MANUFACTURING

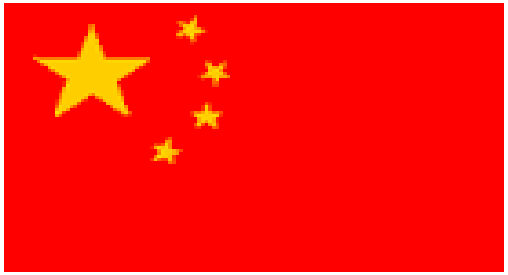
Governmental Support to Additive Manufacturing

In 2012 the White House proposed an investment of $ 1 billion for a National Network for Manufacturing Innovation (NNMI), named **America Makes as of 2013**.

America Makes is a PPP encompassing AM stakeholders and financially supported also by the Federal government. In January 2015 America Makes received more than **$48M** in AM researches.

As of 2014 the US government established a collaborative group on AM called **"GO additive"** participated by 130 officials of key national insittutions as the US Army and Airforce, FAA, ANSA, NIST,

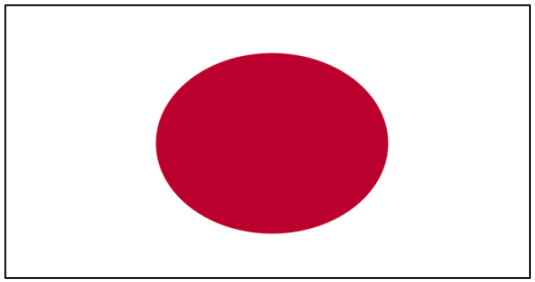
The Additive Manufacturing Consortium established by the Edison Welding Institute (EWI) in 2010 includes 17 industries focused on metal AM development.



PRC invested of AM since the early 1990s, and the Chinese government is pledging 1.5 billion yuan ($245 million) to a seven-years' project to advance development of the technology.

The **Asian Manufacturing Association** a Beijing-funded trade group, is promoting wider integration of AM establishing 10 innovation institutes, each starting with a $3.3 million injection of investment.

The **Chinese Minister of Science and Technology** launched a panel to outline a plan for technical and industrial development in the PRC. Local R&D centers as the Nanjing Research Center of AM are supporting R&Ds , manufacturing integrations and AM start ups,

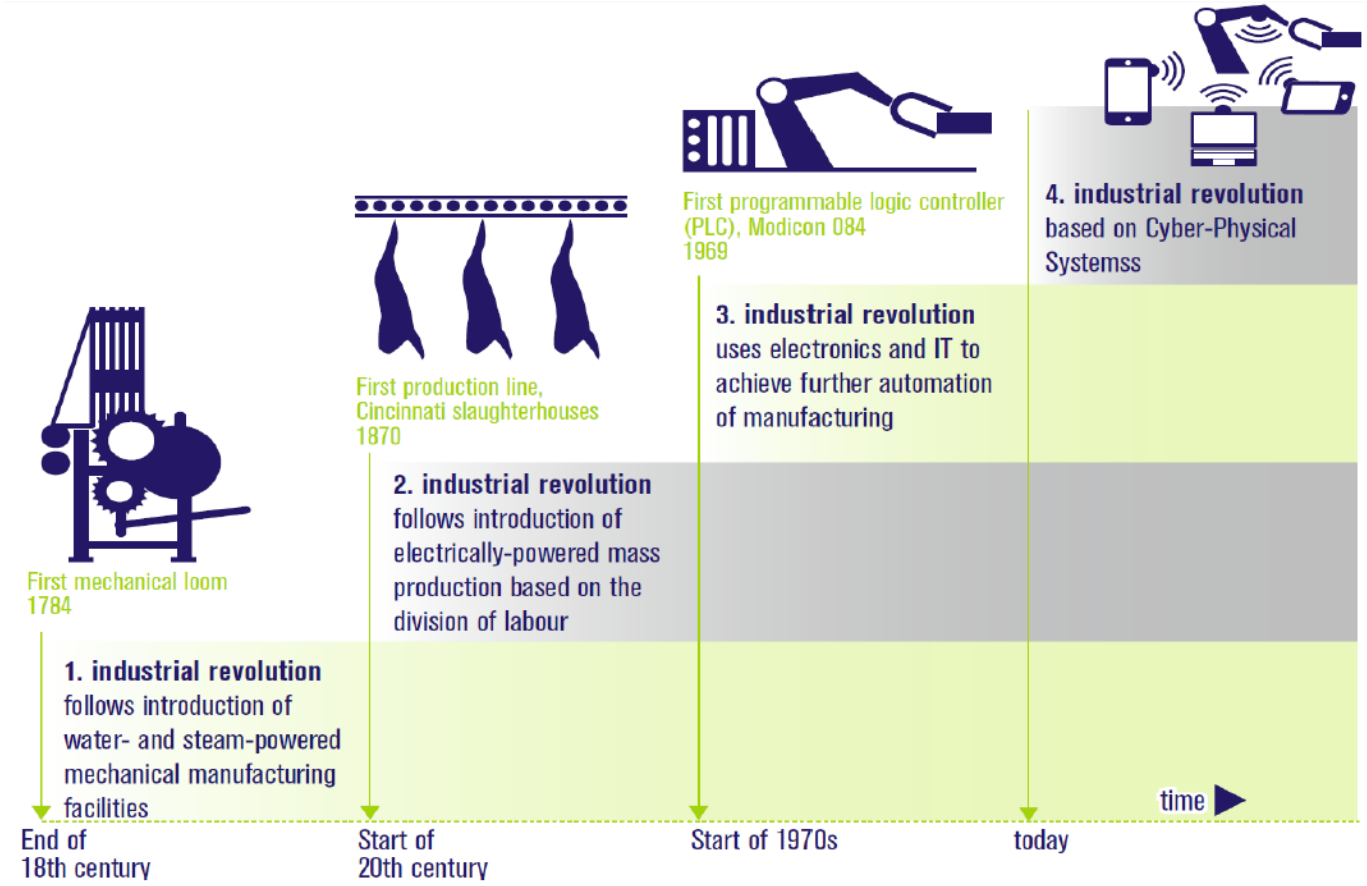


Since 1988 Japan sold photopolymers systems and from the peak of 8 manufacturers, now just 2 remain, while in the past 2 years 4 Japanese companies entered the market with **high-end AM systems** (3 on Hybrid).

The government sees AM as key driver for manufacturing competitiveness and since 2013 specifically invested in products development and capital investment activities. Main initiatives are the creation of the **Technology Research Association** on AM metal development as to develop high precision and productivity of AM systems by 2018. In 2014 the 3D printing consortium of Japan was formed as to promote AM usage

CECIMO, ADDITIVE MANUFACTURING AND THE EU

The Four Industrial Revolutions: Industry 4.0



Source: Acatech (2013).

Key Enabling Technologies as a concept

Key Enabling Technologies (KETs) are investments and technologies that will allow European industries to retain competitiveness and capitalise on new markets providing the basis for innovation in a wide range of products and processes across all industrial sectors (emerging and traditional), and are essential to solving Europe's major societal challenges. Six KETs have been identified as important for Europe's future competitiveness: Advanced Materials, Nanotechnology, Micro- and Nanoelectronics,Industrial Biotechnology, Photonics, and **Advanced Manufacturing Technologies**.

Since the identification and inclusion of the Key Enabling Technologies (KETs) into the European Agenda, growing attention was paid to **Advanced Manufacturing Technologies (AMT)** considered as having the potential to increase industrial productivity and energy efficiency in order to increase socio-economic but also environmental performances of the European industry.

Increasing efficiency and **effectiveness in innovation policy** was the starting point for KETs Strategy

Challenges for KETs and AM development in Europe

One of the main challenges to KETs deployment consists in the so-called “Valley of Death”. A number of initiatives have been undertaken and taken up as priorities under Horizon 2020 and the newly revised Cohesion Policy of the Union. Among others, a **Task Force on Advanced Manufacturing was set up in 2013** by the European Commission in order to **foster the development and commercialisation of AMT and AMT-enabled products.** Other initiatives can be identified at the European level, which can take the form of networks of specific projects. Among other examples are the AM-Platform and specific projects on AM mapping

It is however clear that **knowledge is lacking** on AM and its possible impacts on European industry.

Such knowledge gap is characterized by the **lack of mapping of European capabilities in the field**, difficult to undertake as 3DP remains horizontal and capacities are extremely fragmented across the Union

Challenges for AM development in Europe: two European projects

Identifying current and future application areas, existing industrial value chains and missing competences in the EU, in the area of AM

- To identify most important current and future application areas for 3D printing, as well as the main sectors in which they are (or will be) applied,
- For some specific existing applications, to map and reconstruct the corresponding value chains in EU regions, including the identification of their main actors,
- For some specific future applications, to identify the missing elements or competences hampering their full market deployment and to provide information on collaboration opportunities between EU regions to overcome these gaps.

Vanguard pilot on 3D-printing is one of the leading transnational initiatives on AMT. This pilot is aimed at mapping and connecting demonstration capabilities of EU regions by connecting segments of the 3D-printing value chain(s) across regions.

Additive Manufacturing in EU Research and Innovation

- The EC already provides funds since the First Framework Programme (**FP1**, **1984-1987**), e.g. rapid prototyping with laser scanning of polymers

- The following Framework Programmes (**1988-2013**) ensured continuous support from different EC services and programmes

- In **FP7** (**2007-2013**), more than **60** research **projects** based on AM technologies were funded with a total amount over **€160 million** in **EC funding** and a total budget of around **€225 million**

- **Horizon 2020** has already addressed AM in the Calls for proposals for **2014** and **2015.**

Additive Manufacturing in EU Policy

- The EC **Communication on Industrial Policy** in **2012** mentioned 3DPrinting as a key element for the **new Industrial Revolution**

- The "**Industrial Landscape Vision 2025**", published in **2013** by the EC, showed Additive Manufacturing as a case study on how **Standards** will facilitate new production systems, enhancing EU **competitiveness**

- The EC Task Force for *"**Advanced Manufacturing Technologies for Clean Production**"* presented in its report in **2013** Additive Manufacturing / 3DPrinting as a key **Advanced Manufacturing Technology**

- RTD.D is considering a new policy initiative, "**3D-Printed in Europe**", to support the priority 'A Union of jobs, growth and competitiveness' of the European Council's 'Strategic Agenda for the Union in times of Change'

CONCERNS OF AM INDUSTRIES

EDUCATION

Key statement: *Education and training are fundamental for the constant development of AM and to reduce European unemployment*

Main goal: A European education policy on AM

STANDARDS and CERTIFICATION

Key statement: *Uniform standardization is fundamental to support the development of AM*

Main goal: Joint AM standards development

DEVELOPMENT OF AM APPLICATIONS AND USAGE

Key statement: *SME's are the backbone of the European industry and before investing in AM systems their limited resources are often an obstacle: they require to develop their knowledge to the adoption of AM systems but limitation of resources is often an obstacle.*

Main goal: the further adoption of AM technologies by European SMEs

EUROPEAN PROJECTS ON AM

Key statement: *The EU support to AM related projects is growing,*

Main goal: a stronger impact of European AM related projects

CONCERNS OF THE AM INDUSTRIES: CECIMO AM ADVOCACY ACTIONS and TARGETS

CECIMO strongly believes that a comprehensive European policy is required to support the steady development of Additive Manufacturing: the AMWG activities and the AMEC conference allowed drafting a preliminary strategy to be further discussed with and enriched by AM stakeholders along all the value chain.

Advocacy strategies from the machine tools industry

- Education
- Standards and Certification
- Development of am applications and usage
- European projects on AM

BENEFICIARIES

- Manufacturers of AM Machineries/systems
- End-users of AM Machines
- European AM/National Associations

TARGETS

- European Commission: DG GROW, DG CNECT, DG INNO, DG EAC, DG EMPL, DG TRADE, DG RTD,
- European Parliament: Political Groups (Responsible for Advanced Manufacturing)
- European Parliament :Committees -> DEVE, INTA, EMPL,ITRE,REGI
- European Agencies: EASME, ESA, INEA, ERCEA
- European Financial institutions: EIB
- European Manufacturing/Stakeholders institutions: EESC
- European Research/Scientific centres: JRC

Let us know your Advocacy requirements

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