

Update Report 3

Comparison of international approaches to public support for additive manufacturing/3D printing

This document is one of a series of brief updates on the development of a UK National Strategy for Additive Manufacturing / 3D printing (AM-3DP). Information on the background to the development of the strategy is provided at www.amnationalstrategy.uk.

This update summarises a selection of contrasting international approaches to supporting the adoption of AM-3DP.

Country	Recent AM-3DP Strategies/Policy Reports	Example AM-3DP areas of focus / initiatives
China	AM highlighted as part of “ Made in China 2025 ”: Nine priority areas: improving manufacturing innovation, integrating IT and industry, strengthening the industrial base, fostering Chinese brands, enforcing green manufacturing, promoting breakthroughs in 10 key sectors, advancing restructuring of the manufacturing sector, promoting service-oriented manufacturing and manufacturing-related service industries, and internationalizing manufacturing. ¹ Has also produced “ Additive Manufacturing Industry Promotion Plan 2015-2016 ”	Five explicit areas of focus for AM in China: development of AM materials (metal, non-metal, medical-specific); improvement of processes (for metals/non-metals: SLM, LENS, EBSM, EBDM, SLA, FDM, SLS, et al.); development of equipment ; establishment/refinement standards ; promotion of demonstration projects . Particular focus on aerospace and medical applications.
Germany	AM has dedicated chapter within “ German Bundestag: Report on research, innovation and technological performance Germany 2015 ” ² : Within broad context of high-technology manufacturing, strong connection between growth of Industry 4.0 and AM – perceived an area of strength and opportunity for Germany.	Leverage links between Industry 4.0 and AM to be promoted (via Ministry and Economy and Energy); government should support development of QA and testing/certification activities; regional programmes to support collaboration with research institutes (via Ministry for Education and Research) and coordination of currently fragmented AM support programmes ; need to ensure AM skills development in universities, schools and in-company – requirement for AM competence for teachers/trainers.
Japan	AM highlighted within “ 2014 Points of Economic and Industrial Policies ” ³ as key to ambition to achieve transformation of Japanese manufacturing industry and the revitalisation of regional manufacturing activities.	Particular focus on role of AM in revitalisation of regional clusters through development and deployment of AM technologies. Broader aim of transformation of Japan’s manufacturing industries to be high-value added ones by developing next-generation 3D printers and materials for industrial use, speeding up the

¹ http://english.gov.cn/policies/latest_releases/2015/05/19/content_281475110703534.htm

² <http://dip21.bundestag.de/dip21/btd/18/043/1804310.pdf>

³ http://www.meti.go.jp/english/aboutmeti/policy/fy2014/pdf/0906_001a.pdf

		printing process (10x), making it more precise (5x), and achieving greater diversity in materials , as well as peripheral technology including infrastructure for evaluating internal and external 3D measurement.
South Korea	<p>AM highlighted within “2015 Smart Manufacturing R&D Mid- to Long-term Roadmap” as one of eight smart manufacturing technologies (smart sensors, cyber physical systems, 3D printing/AM, energy conservation, IoT, cloud computing, big data and holograms).</p> <p>Also produced “2014 Roadmap for 3D Printing Strategic Technology”⁴ and “2014 3D Printing Industry Promotion Strategy”⁵ (and associated new act of government: ‘Act of 3D Industry Promotion’) that covers range of initiatives across a range of government ministries.</p>	<p>The 2015 roadmap targets ‘raising technology maturity by 17% by 2020’ and the necessary technology development will be reflected to the national R&D plan. The 2014 strategy was very broad (e.g. 3D printing education in schools, selecting 10 universities annually to be specialized universities for 3D printing; on-job training for 3D printing, provision of R&D funding for 3D printing and related software, deployment of ‘Mobile factory’ with AM to showcase to SMEs, etc.) but with very specific targets (e.g. to make 5 global leading firms, achieve 15% global market share and 20% of new patents). 2014 3DP roadmap focuses on eight product areas (medicine, die & mold, culture and defense, electricity and electronics, cars, airlines, ship building and energy, and design / distribution).</p>
United States	<p>AM as key strand within National Network for Manufacturing Innovation (NNMI)⁶ (enacted through ‘Revitalize American Manufacturing and Innovation Act of 2014’) under the umbrella of America Makes⁷.</p>	<p>NNMI’s AM flagship initiative is America Makes (along with the associated National Center for Defense Manufacturing and Machining). America Makes is a public-private partnership focused on improving manufacturing competitiveness by: open exchange of AM information and research; development, evaluation, and deployment of AM technologies; supporting supply of education and training in AM technologies; serving as a national institute with regional and national impact on AM capabilities; linking U.S. companies with existing resources, with an emphasis on SMEs and start-ups.</p>

Prof Phill Dickens and Dr Tim Minshall

March 2016

⁴ <http://english.motie.go.kr/?p=5363>

⁵ <http://www.businesskorea.co.kr/english/news/industry/13270-smart-manufacturing-400-billion-won-invested-smart-manufacturing-rd-next-five>

⁶ <http://manufacturing.gov/nnmi.html>

⁷ <https://americamakes.us/>