



EUROPEAN POLICY BRIEF

CHINA-EU Standards

**China EU Information Technology Standards
Research Partnership**

March 2011

INTRODUCTION

**China's increasing activity
in ICT standardisation**

The People's Republic of China has recently begun to be remarkably active in many areas of Information and Communication Technology (ICT) interoperability standards as part of an effort to promote 'indigenous technologies'. This raises important challenges for China which, despite possessing strong manufacturing capabilities, has limited experience in international standardisation and in ICT innovation.

**Important consequences
for Europe**

These developments also have important consequences for the European economy and the global ICT market, especially those related to technology platforms such as mobile internet, next generation networks and audio-visual products. For example, will the outcomes be open standards and alignment between regional economies, or competitive standards processes leading to so-called "standards wars" and the fragmentation of global markets? Some US commentators have even warned of "Chinese techno-nationalism". How should European Policy makers respond to these challenges, in developing a standardisation policy oriented to innovation and in developing relations with China? How can European single market, competition, employment and industry policy respond to the growing importance of China and Chinese firms as a global player in many areas of ICT innovation?

**Developing
European policy**

European policy makers are currently working to modernise the standardisation regime in order to support innovation and meet the challenges of globalisation. Various important initiatives to promote European standards practices in China have already been launched. However, future policies need to systematically and strategically address China, which is emerging as a key global power in production and consumption of ICTs.

The China-EU Information Technology Standards Research Partnership has achieved important insights into the rapidly evolving policies and strategies of Chinese government and innovation actors. The Partnership built a multidisciplinary international knowledge network, conducted studies and held policy workshops to investigate China's increasing involvement in global standardisation processes, development of innovation capabilities and engagement with changing global markets.

This brief summarises the policy implications of "China EU Standards". This EU-funded research project examined the implications of China's increasing involvement in standardisation and the innovation of advanced Information and Communication Technologies (ICTs).

The findings are based upon case-studies of Chinese developments in three areas (mobile telephony, mobile broadcast and Audio-Visual Codecs) and their European counterparts, supplemented by workshops with European and Chinese academics and practitioners.

KEY OBSERVATIONS

Evidence from 3 cases

AVS Audio-visual codec standard

Audio-visual codecs which govern the encoding and compression of digital signals play a vital role with the convergence of digital media, allowing compatibility across different networks and applications. AVS was developed as an alternative to the almost globally accepted MPEG-4/H.264 codec.

The primary objective was to reduce IPR licensing fees, which had become higher than manufacturing costs for competitively priced products like Digital set-top boxes, and were a considerably higher part of the sale cost in China than in developed economies. AVS however was not a purely Chinese effort: the initiative attracted foreign firms, and efforts were made to introduce AVS into international standardisation processes, for example, through the ITU.

The goal of reducing licensing costs with AVS involved developing a Patent Pool that tried to balance Chinese Law and cultural values with global practices - an explicit learning process by Chinese standards players attempting to develop expertise in this aspect of standardisation.

In terms of implementation, though the standard is included in some systems, so far no clear implementation policy is in place in China.

Mobile TV

As in the EU, policy makers in China have not in practice reached agreement as to who should or can set a market-wide Mobile TV standard. In China this case illustrates tensions between different parts of government, notably the Ministry of Industry and Information Technology (MIIT), the telecommunications ministry which decides which standards are legal to deploy on handsets with telecommunications capabilities, and the State Administration of Radio, Film and Television (SARFT) which controls standards for national television programming. Despite there being a “formally” selected standard, SARFT has successfully promoted its own preferred CMMB standard to the extent of implementing it through a large-scale programme of investments across many Chinese cities.

Mobile Telephone and Broadband

Perhaps the most high profile case is that of the Chinese TD-SCDMA (TD) standard for 3G mobile. With the policy objective of reducing IPR licensing costs for future mobile systems and develop national technological competence a 1998 proposal for ‘Chinese’ 3G mobile specification based largely on systems developed in Europe was accepted as a standard by the ITU. Building on foreign technology and using an international standards route encouraged a range of major foreign telecoms vendors to invest in joint ventures, with the promise of significant market opportunities in China.

Despite early expectations of TD becoming a unique Chinese standard, TD was slow to attract high-level government support and many were surprised by the 2008/2009 reorganisation of the Chinese Telecoms industry creating three networks using three different international (EU, US and China-centred) 3G standards. Today, TD is portrayed as Chinese success story, and it is now being spoken of as a 'standard for export', particularly to developing economies. Moreover it has paved the way for China's involvement in global systems for future mobile. This, coupled with the success of Chinese telecoms vendors Huawei and ZTE in international sales and their growing innovation capacity, have increased China's confidence and participation in 3GPP, ITU and other telecommunications SDOs.

Analysis

How does the development of interoperability standards contribute to Innovation in ICTs?

1. Standardisation processes are key in catalysing and shaping ICT innovation, particularly for creating complex technological systems that require multiple technological inputs from diverse players. This relates not only to the work of Standards Developing Organisations (SDOs) in negotiating specifications and supporting testing, but also policies and strategies for standards implementation.

How is the global standardisation environment changing to meet changing innovation challenges?

2. There has been a worldwide shift from formal public SDOs to fora and consortia-based approaches, containing supplier, user and regulatory members, which are potentially faster moving and more responsive than traditional formal SDOs (which have responded by reforming and accelerating their processes and opening themselves up to consortia-based standards). The proliferation of standardisation bodies in an increasingly globalised setting means that there is competition between standards bodies. Despite a technocratic approach, there are also subtle tensions within SDOs, as participants press for standardisation decisions that further their interests. The ability to operate successfully within standardisation bodies is becoming a core strategic competence of firms, and a focus of innovation policy.

Standardisation is a complex process of alliance building, and dealing with technical and market change. It is in rapid flux and offers policy makers and firms considerable challenges as well as scope for *Learning By Standardisation*, where attempts to drive and use standards processes lead to re-evaluation of policy and development of competences. Recently emerging outcomes include: establishing processes for setting specifications and addressing complementary functions such as testing and compliance processes and the operation of patent pools; and policies for the implementation of standards, e.g. through mandating standards, licensing policies, public procurement and infrastructure policies and investments.

The evolution of China's Standards policy

In this rapidly evolving context, the objectives of Chinese standards policies appear to have changed. In the early 2000s key objectives were 1) to reduce the costs of IPR licensing for Chinese manufactures and consumers, and 2) to develop technological capabilities, often via technology transfer. However by the end of the decade other objectives appear important:

1. Technological independence. Programmes of technological capability development are aimed at facilitating independence, and furthering national security aims
2. Demonstration of national capability: Flagship standards, such as TD-SCDMA demonstrate national capability on a global stage
3. Standards Export: There are far greater global ambitions, with export of 'Chinese' innovations and standards, and participation in global markets.

The development of AVS and TD-SCDMA are seen as important steps in developing national competence, and giving Chinese firms and standardisation bodies confidence to operate within the global standards processes.

China has the ability to intervene to implement standards and create markets

China has demonstrated a great ability to create single markets, based on a single mandated standard, that bring the benefits of scale that are crucial for creating standards-based infrastructures. This reflects the authority of the state to coordinate the efforts of diverse private as well as public players and the substantial investments dedicated to planning a number of key technology infrastructure projects (and it should be noted that service innovation may be less amenable to such centralised initiatives). However, while national standards can be mandated in China, unlike voluntary standards in Europe, this does not always mean that single standards are implemented, as illustrated by the case of AVS, or that the formal standardisation process works as intended, as with the case of Mobile TV. *The Mobile Telephony/Broadband case demonstrates a deliberate (and perhaps unprecedented) decision to promote and implement three globally-competing standards rather than encourage or mandate the adoption of a single standard.*

European broadcasting and telecommunication markets are fragmented

The Chinese situation stands in contrast to the fragmentation of European markets at the national level (despite the European Single Market policy) in telecommunications and broadcasting.

Chinese government policy is not monolithic – but grapples with competing orientations

However, as the marked differences between these cases show, China's policies are not monolithic – differing industrial and regional priorities produce diversity and fragmentation. We found striking differences in tradition and orientation between the national Ministries involved. As well as reconciling the specific goals of different parts of government which are being brought in contact as a result of technology and service convergence, Chinese policymaking grapples with tensions between the development of a globally competitive industry and securing internal goals, such as cheaper infrastructure and national security.

The evolving Chinese Intellectual Property Rights (IPR) Regime

How does China's IPR regime relate to Standards-based Innovation?

1. A regime of intellectual property rights applying to technology has developed rapidly over the last 10 years to bring it in line with the global IP regime. However, the administration and enforcement of IP legislation remains weak – hampered by the shortage of professional experience. These weaknesses will only gradually be resolved.
 2. In the past, European firms have complained of 'forced' IPR transfer to Chinese industry through joint ventures and non-payment of licence fees. Chinese players in particular counter that there is no evidence for this. However practices that encourage technology transfer and low licence fees are likely to figure in the future as a way to 'level the playing field'.
 3. Cross licensing among established players who hold essential IPR (patents on core technologies required by a standard) in a standard disadvantages newcomers and outsiders. Chinese firms and other newcomers are able to use a modest number of potentially 'essential' patents to enter foreign or global standards processes on more equal footing with established players.
 4. Chinese organisations have become very active in patenting. Despite a limited prior patent base, China has become number 5 in the world for new patent applications (though uptake of these patents remains relatively low). As Chinese firms gain more IP relevant to global markets, Chinese policy (and IPR enforcement practices and public attitudes) is likely to become more supportive of the global IPR regime.
 5. Chinese industry/state initiatives to reduce costs of IPR to Chinese implementers are likely to prove attractive to firms worldwide. Chinese standardization efforts may helpfully diversify the innovation ecology, opening up alternative technology development pathways, which might otherwise be 'locked out' by established global standards including low cost products geared towards developing economies.
 6. Chinese public policy responses to IPR arrangements from outside China that are apparently disadvantageous to China will continue to emphasise Chinese interests. This may include making sure there is competition between standards and discouraging single standards with disadvantageous IPR conditions.
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RECOMMENDATIONS FOR POLICY MAKERS

The EU needs to attend to innovation and standardisation by China

China is taking an increasingly active role in international standardisation, not only within existing processes, but able to initiate new standardisation processes and promote alternative technology development trajectories. Europe must recognise this as a challenge and an opportunity and work with China to further Europe policy aims.

The European approach to standards-related innovation has been promoted as an alternative to the 'US way' in terms of organisation and policy. China is developing the capacity to be an additional centre (and perhaps a third model) of standards-related innovation with potential global impact.

Due to the huge size of its market, and its ability to coordinate state and private players, China can generate internal markets to implement standards and create critical mass for export.

The EU needs an Integrated Policy on Standards, Innovation, IPR etc

Europe requires a 'joined up' standards and innovation policy. As the EXPRESS report highlights, this is not facilitated by the fragmentation of responsibility between various European Commission Directorates General (including Competition; Enterprise and Industry; Information Society and Media; International Development; Research) and the European Standards Organisations (ESOs, which encompass EFTA and other non-EU states). A more active standards policy is needed that addresses standards implementation and the European role in global standards processes, especially in relation to emerging technologies.

The EU needs to engage with China

European policy actions on standardisation for innovation must make explicit engagements with China. There has been a range of important initiatives by the EU and ESOs, such as the China EU/EFTA Standardization Information Platform (CESIP). Europe needs to sustain and expand this activity, building upon these foundations. This needs to include continued support to allow European firms to gain expertise and experience in Chinese standardisation processes.

Contrasting Views from China and Europe of each other's standardisation system

The View from Europe

It is a paradox that European and Chinese players both see standards and standardisation processes as barriers to market entry (in China and Europe, respectively) – for slightly different reasons as outlined below:

The view from Europe is generally that standards and standardisation processes in China are barriers to market entry due to:

- 1. Unknown and difficult regional and sectoral standards;**
- 2. Some Standardisations processes appear to be controlled or shaped by public policy and links between government and Chinese firms;**
- 3. Mandatory standards regime can be difficult for firms used to voluntary standards in Europe.**
- 4. *After China's accession to the WTO and TRIPS, Chinese standards have been seen as levers to force IPR transfer or make entry into Chinese markets more difficult for foreign firms***

The View from China

The view from China is that standards and standardisation processes in Europe are a barrier to trade, both to enter foreign markets, and to compete within China. Usually standards are seen as reducing trade barriers – however contemporary standards that include significant essential patents make it :

- 1. Complex and difficult to enter standardisation process without expertise.**
- 2. Are seen as an “unfair advantage” and a barrier to Chinese entry and implementation.**
- 3. They include IPR regimes that are too expensive for Chinese markets, and the failure of some patent pools makes it hard for Chinese firms without established IPR portfolios to strike necessary IP agreements that enable them to compete effectively.**

The EU and ESOs needs to extend and further develop their existing programmes in China encouraging formal standard-process capability and education. As China develops capacity and a distinctive tradition this should be seen as a mutual search for best-practice in standardisation, rather than a simple transfer of European expertise.

The EU needs to work with China in seeking common public interests around media and communications and in *setting objectives for global standardisation processes*

China will continue to use international standards bodies and consortia to further Chinese interests; this should be encouraged. Consortia in particular provide fora that foreign firms can have confidence in.

Research and Innovation (R&I) programmes provide the input to standardisation processes: increased cooperation on international R&I collaboration will help align interests of corporate players and build consensus.

Issues for the EU and China: the changing global standardisation environment

Some Chinese multinational organisations have become fully involved in global standards consortia. However smaller firms from China (and Europe for that matter) find it difficult to gain access. There is a need to make standards consortia more accessible. Strong global standards consortia can promote global alignment and reduce innovation uncertainties – and it may be beneficial for them to continue from one standards generation to the next (though existing standards processes and SDOs may not continue to be the most important in the future). The EU must support the development of standards processes for future Internet platforms and services that further European goals. This will include opening them up internationally and ensuring that they are attractive to China-based industrial players and Chinese policy makers.

Intellectual Property Rights (IPR) Policies

There is a need to encourage the setting of IPR licensing levels differently in different economies, such that costs are appropriate to local markets.

Patent pools are expected to have an increasingly powerful effect on innovation - both positive and negative. Attempts are being made in China to develop 'China-friendly' patent pools, and European policy makers must engage with this process.

Developing countries policy

Europe must develop a better understanding of how developing countries could become engaged in global standardisation processes and help them move up 'the standardisation ladder'. China could be an exemplar and a leader in the developing world, for example by e.g. supporting low cost standards.

RESEARCH PARAMETERS

Objectives of China EU Standards

The China-EU Information Technology Standards Research Partnership has sought a deeper understanding of the rapidly evolving context of standards-related innovation in China and their implications for European policies and innovation strategies.

Methodology

This support action carried out five main kinds of activities:

- i) *Research networking*: the partnership developed an extensive network of policy makers, practitioners and academics with an involvement and expertise in standards-related innovation in China and Europe.
- ii) *Research workshops*: Research networking was facilitated by research workshops in Europe (*ICT2008*, Lyons, 26th November 2008) and Beijing (Tsinghua University, Beijing 17th April 2008 Mandarin/English and *I-ESA conference*, Youyi/Friendship Hotel, Beijing, 20th April 2009).
- iii) *Case studies*: The research team from the European and Chinese project partners undertook three case studies of technical systems that were standardised as a result of public policy initiatives in China to develop a China-centric standard.
- vi) *Policy workshops*: Additional inputs were secured through research workshops in Beijing (Youyi/Friendship Hotel, Beijing, 8th December 2009) and Brussels, (CEN/CENELEC Meeting Centre, Brussels, 15th February 2010) at which policy and industry experts helped pull out implications for policy and practice.
- v) *Dissemination*: Project findings were disseminated through wide circulation of a Newsletter (produced in a high quality format), through the project website, and through the creation – in the course of research and policy workshops and wide dissemination activities - of a list of associates. Through regular electronic liaison these received early project findings and provided valuable feedback about both findings and their implications.

The project was targeted towards the *Identification and promotion of co-operation opportunities [and] support to policy dialogues* to fulfil outcomes expected from Objective ICT-2007.9.1, 'International Co-operation'.

PROJECT IDENTITY

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Funding scheme

FP7 Socio-economic Sciences and the Humanities programme, topic SSH-2007-8.2. "Horizontal measures to support international cooperation".

Budget	EU contribution: 370.060 €
Duration	March 2008 - February 2010 (24 months)
Website	http://www.china-eu-standards.org
Further reading	<ul style="list-style-type: none">• European Commission White Paper Modernising ICT Standardisation in the EU - The Way Forward, July 2009;• Report of the Expert Panel for the Review of the European Standardization System (EXPRESS) "Standardization For A Competitive And Innovative Europe: A Vision For 2020, February 2010;• Special edition of Technology Analysis and Strategic Management (summer 2011) on 'China and Global ICT standardisation and innovation'.

**Participants at Final Policy Workshop
CEN/CENELEC Centre, Brussels, 15th February 2010**

