

# China will lead the world in terms of NB-IoT, which will benefit Chinese vendors and the ecosystem worldwide

January 2018

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Few operators have launched commercial NB-IoT networks since the technology was standardised in 2016, despite the strong push from Deutsche Telekom and Vodafone. However, China’s operators are the exception. Backed by strong government support, all three operators claim to have rolled out the technology to tens of thousands of base stations. Developments in China will benefit the entire NB-IoT ecosystem, not least Chinese hardware and software firms looking to export to other countries. This article explores the progress that China is making with NB-IoT, the implications for the technology, and what it means to other operators.<sup>1</sup>

## Chinese operators are making important progress in developing NB-IoT, which will benefit all NB-IoT ecosystem players

The Chinese government has been actively driving the development of NB-IoT. The Chinese telecoms regulator, the Ministry of Industry & Information Technology (MIIT), announced aggressive targets as well as guidance to promote the NB-IoT standard in June 2017 (see Figure 1).

**Figure 1: MIIT’s targets for NB-IoT development in China [Source: MIIT and Analysys Mason, 2018]**

Timelines	Geographical coverage	Number of base stations	Number of connections
End of 2017	All major cities in China	400 000	More than 20 million
2020	Nationwide coverage	1.5 million	More than 600 million

In accordance with the MIIT, all three Chinese mobile operators are investing heavily in NB-IoT networks and device/module manufacturer subsidies. They are also developing capabilities beyond connectivity to cover more of the value chain (Figure 2).

**Figure 2: NB-IoT initiatives by operator, China, 3Q 2017 [Source: Analysys Mason, 2018]**

	China Mobile	China Telecom	China Unicom
Position in China’s mobile market (connections and service revenue, 3Q 2017)	Number 1	Not applicable	Number 2
Position in China’s fixed broadband market (connections and service revenue, 3Q 2017)	Number 2	Number 1	Number 3
Network roll-out	NB-IoT across 346 cities. Commercial launch in	The first in China to achieve nationwide NB-IoT coverage	Pre-commercial NB-IoT networks in selected key cities by November 2017.

<sup>1</sup> For more information, see Analysys Mason’s *China IoT market report 2018*. Available at [www.analysysmason.com/china-iot-market-rdme0](http://www.analysysmason.com/china-iot-market-rdme0).

	China Mobile	China Telecom	China Unicom
	selected cities planned for end of 2017.	in May 2017, with 310 000 base stations upgraded.	More than 300 cities are ready to be quickly activated for NB-IoT.
Ecosystem support	Formed the China Mobile IoT Alliance and announced in November 2017 that it would invest CNY2 billion (USD300 million) in 2018. <sup>2</sup>	Announced that it would invest CNY300 million (USD45 million) to help subsidise modules/devices. <sup>3</sup>	Announced its CNY1 billion (USD150 million) subsidy plan as well as CNY10 billion (USD4.5 billion) industry funding. <sup>4</sup> Backed up by a consortium of investors including Internet players.
Platform	Launched OneNET open platform in July 2015.	Released an IoT open platform in June 2017.	Launched an IoT connectivity management platform in 2015. <sup>5</sup>
Key verticals	Automotive, smart cities, transport and logistics, consumer electronics.	Smart manufacturing, smart cities, smart home, automotive.	Smart manufacturing, smart cities, transport and logistics, retail.

The steps taken by the Chinese operators should help the NB-IoT ecosystem globally. The Chinese networks are on a massive scale, which should help reduce prices and resolve initial problems. This should also benefit Chinese companies, such as Huawei, that are heavily involved with the technology, as they look to markets outside of China, as well as Chinese manufacturers and app developers.

## Chinese operators are looking beyond connectivity for a return

The network connectivity business depends heavily on scale to generate returns, and even Chinese operators, especially China Mobile, will see negative RoI from NB-IoT for years. The upgrade plans of the three operators are as follows.

- Most of the 310 000 base stations of **China Telecom** that have been upgraded for NB-IoT are new-built FDD-LTE stations refarming its 800MHz CDMA spectrum, which just require software upgrade. China Telecom's list price is CNY20 (USD3) per year per NB-IoT connection.<sup>6</sup>
- **China Unicom** also has an FDD-LTE network but most of its base stations operate at 1800MHz, which many existing modules do not support. Therefore, it chose to upgrade its 900MHz FDD-LTE stations first to support NB-IoT, such as its 900MHz network in Shanghai.
- **China Mobile** is building new base stations to support NB-IoT, as its existing TD-LTE network does not support the FDD-based NB-IoT standard and most of its GSM base stations would require extensive hardware and software upgrades. It has announced aggressive goals for its NB-IoT network roll-out with

<sup>2</sup> Source: Caixing Global: [www.caixinglobal.com/2017-11-25/china-mobile-to-invest-two-billion-yuan-on-iot-services-in-2018-101176272.html](http://www.caixinglobal.com/2017-11-25/china-mobile-to-invest-two-billion-yuan-on-iot-services-in-2018-101176272.html).

<sup>3</sup> Source: Digit Times: [www.digitimes.com.tw/iot/article.asp?cat=158&cat1=20&cat2=10&id=0000501946\\_wzjl97kk36q8x374wjodh](http://www.digitimes.com.tw/iot/article.asp?cat=158&cat1=20&cat2=10&id=0000501946_wzjl97kk36q8x374wjodh).

<sup>4</sup> Source: CWW: <http://221.179.172.81/pdf/2D9DADB3128048F1A4D58AE3E522E151.pdf>.

<sup>5</sup> Source: CNII: [www.cnii.com.cn/telecom/2017-09/12/content\\_1888228.htm](http://www.cnii.com.cn/telecom/2017-09/12/content_1888228.htm).

<sup>6</sup> Source: Sina: <http://tech.sina.com.cn/roll/2017-07-08/doc-ifyhweua4391708.shtml>.

the initial phase including a reported 146 416 base stations.<sup>7</sup> In total, it plans to build more than 400 000 NB-IoT base stations in 2017 and 2018.

The operators are looking to diversify beyond connectivity, because all three are likely to offer similar pricing and coverage. Extra services may include vertical solutions, application development, system integration as well as enabling services such as platforms, hosting and security.

China Mobile has a “terminal-pipe-cloud” strategy: beyond the pipe (connectivity), it also develops its own devices (such as AndMu<sup>8</sup>) and modules as well as cloud and big data services built on its connectivity management platform and OneNET platform.<sup>9</sup>

China Unicom has developed smart sewage-well-cover solutions to offer real-time information on the location, status and the tilt angle of the well covers based on NB-IoT. It also offers end-to-end solutions in areas including smart streetlighting, smart metering and smart grid.<sup>10</sup>

China Telecom is developing one-stop solutions integrating smart appliances and smart home services with its partners.<sup>11</sup> All three Chinese operators have built platforms and portfolios of enabling services, and can offer end-to-end solutions with the help from partners in key verticals.

China may also have a significant impact on LoRa. Dr. Peng, the fourth-largest fixed broadband ISP with over 100 million households, is building a LoRa network. As with NB-IoT, the scale that China offers, both in terms of demand, but also in terms of hardware and software supply, could help to accelerate the development of LoRa.<sup>12</sup>

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<sup>7</sup> Source: Sohu: [www.sohu.com/a/193880770\\_203761](http://www.sohu.com/a/193880770_203761).

<sup>8</sup> AndMu is a smart camera developed by China Mobile. More details available at [www.andmu.cn/](http://www.andmu.cn/).

<sup>9</sup> Source: CWW: [www.cww.net.cn/article?id=410035](http://www.cww.net.cn/article?id=410035).

<sup>10</sup> Source: CNII: [www.cnii.com.cn/telecom/2017-09/13/content\\_1888574\\_2.htm](http://www.cnii.com.cn/telecom/2017-09/13/content_1888574_2.htm).

<sup>11</sup> Source: China Telecom: [www.chinatelecom.com.cn/news/02/201712/t20171228\\_37678.html](http://www.chinatelecom.com.cn/news/02/201712/t20171228_37678.html)

<sup>12</sup> Source: IoT Business News: <https://iotbusinessnews.com/2016/11/22/80140-semtech-lora-technology-enables-iot-services-chinas-largest-private-telecom-network/>.