Title: **Interactive Study on The Tallest 20 in 2020: Then and Now**

Authors:

Subjects: Architectural/Design
History, Theory & Criticism

Keywords: Historic Context
Megatall

Publication Date: 2020

Original Publication: CTBUH Journal 2020 Issue II

Paper Type:
1. Book chapter/Part chapter
2. **Journal paper**
3. Conference proceeding
4. Unpublished conference paper
5. Magazine article
6. Unpublished

The Tallest 20 in 2020: Then and Now

Abstract

This research paper undertakes a review of the 2012 report by the Council on Tall Buildings and Urban Habitat, "Tallest 20 in 2020: Entering the Era of the Megatall," assessing the accuracy of the predictions made at that time against the reality of the present day. It reviews the development trajectory of CTBUH's 2012 predicted and unanticipated 20 tallest buildings in the world in the year 2020, and places the results in regional, industry and historical context.

Keywords: Development, Economics, World's Tallest Building

In 2012, the CTBUH Journal published a research paper titled "Tallest 20 in 2020: Era of the Megatall—The Projected World's Tallest 20 Skyscrapers in the Year 2020." Though it was only eight years ago, the pace of change in the tall building world at the time was such that 2020 seemed like a distant lodestar in the future. The future, of course, has the inconvenient habit of appearing in the present far too early for the comfort of most. Today, the CTBUH Research and Editorial teams review the projections we made in 2012, the assumptions that guided them, and the roller-coaster reality of what has come hence.

Prediction 1

"By 2020, we can expect that at least eight megatall buildings (of 600 meters' or greater height) will exist worldwide."

Reality

In the second quarter of 2020, there are three megatall buildings in existence. These are the Burj Khalifa, Dubai (828 meters); Shanghai Tower, Shanghai (632 meters); and Makkah Royal Clock Tower Hotel (601 meters), Mecca (CTBUH Skyscraper Center 2020).

What Happened?

Five of the eight megatall buildings projected in 2012 to complete by 2020 did not achieve that goal. Here are their stories:

Wuhan Greenland Center, Wuhan

- Predicted 2020 rank in 2012: 7 (606 m)
- Actual rank in 2020: n/a (476 m)*

The Wuhan Greenland Center had been designed to rise to 606 meters with a curved crown, but construction had already begun when aviation authorities then intervened, concerned that future flight paths around Tianhe International Airport would be curtailed if towers in the city rose to that height (see Figure 1). The compromise design, with a similar curved top but wider proportions, will rise to 476 meters, knocking Wuhan Greenland Center from a 2012–predicted number 7 rank in 2020 and out of "megatall" status. If completed today, the still under-construction building would be the world's 23rd-tallest building.* It is currently difficult to predict a final completion date, however, due to the developer's alleged failure to make payments to the contractor. In October 2019, the contractor removed all its workers from the site until the dispute could be settled (Sun 2019).

Jeddah Tower, Jeddah

- Predicted 2020 rank in 2012: 1 (828 m)
- Actual rank in 2020: n/a

Jeddah Tower, which began construction in 2013 and was then called Kingdom Tower, has experienced numerous delays and remains under construction in 2020. News reports peg a "topping out" by the end of 2020, but it is unclear when completion may finally happen (Gibbon 2020). If it were completed now, and for some time in the foreseeable future, it would become the World's Tallest Building at more than

Figure 1. Wuhan Greenland Center, Wuhan, was intended to be a "megatall" at 606 meters (left) but was cut down by aviation authorities, to 476 meters (right). © AS+GG (left); Baycrest (cc by-sa) (right)

1,000 meters (the exact height figure remains undisclosed).

Seoul Light DMC Tower, Seoul
- Predicted 2020 rank in 2012: 4 (640 m)
- Actual rank in 2020: n/a

The predicted world's fourth-tallest building in 2020 was expected to reach 640 meters. In 2012, the contractor that had intended to construct the building failed to pay for the land plot, and the project was scrapped (Bae 2015). Discussions have been ongoing since 2015 to restart the project, potentially with a shorter tower (Kim 2018).

Signature Tower, Jakarta
- Predicted 2020 rank in 2012: 4 (638 m)
- Actual rank in 2020: n/a*

The Signature Tower in Jakarta, proposed in 2009, at 638 meters, was anticipated in 2012 to become the world's fifth-tallest building by 2020. However, multiple design changes and failed geotechnical/hydrological tests caused the first round of delays (Alexander 2014). The project eventually received design approval from local authorities in 2015, and approval for construction in 2017 (Alexander 2015a, 2015b; Freycinetia & Puspa 2017). However, it was still short some US$1.7 billion in funding, and remains stalled (Dwijayanto 2018).

This is not to imply that the road had been smooth for the three megatalls that did complete, however—or for that matter, for practically any of the buildings on the 2020 World's Tallest List, then or now.

Burj Khalifa, Dubai
- Predicted 2020 rank in 2012: 2 (828 m)
- Actual rank in 2020: 1 (828 m)

The Burj Khalifa, completed in 2010, became the World's Tallest Building at that time and retains the title today. Its iconic status has driven much development around its periphery, delivering value above and beyond the building itself. Its grand opening was in January 2010, which coincided with a name change from "Burj Dubai" after Sheik Khalifa bin Zayed al-Nahyan provided financial assistance to finish the project (Thomas 2010). It was declared the World's Tallest Building by the Council in March 2010 (CTBUH 2010).

Figure 2. Ping An Finance Center, Shenzhen–proposed in 2008 and originally set to rise 660 meters (left), it was completed in 2017 at 599 meters (right), due to changes in aviation restrictions. © Kohn Pedersen Fox Associates (let); Tim Griffith (right)

Ping An Finance Center, Shenzhen
- Predicted 2020 rank in 2012: 3 (660 m)
- Actual rank in 2020: 4 (599 m)

Like its cousin in Wuhan, Ping An Finance Center received a "haircut" due to aviation restrictions being imposed after the buildings had been designed. The office building was originally intended to reach 660 meters by way of a spire at its top (see Figure 2). During the design process, local aviation authorities, concerned that a building of that height might impede the range of potential flight paths in and out of Shenzhen Bao'an International Airport, restricted its height to 600 meters, maximum. The redesign completed the building's architectural expression with a pyramidal crown, bringing its final height to 599 meters—and thus removing the classification of "megatall."

Shanghai Tower, Shanghai
- Predicted 2020 rank in 2012: 6 (632 m)
- Actual rank in 2020: 2 (632 m)

While Shanghai Tower didn't break ground until 29 November 2008, plans for a tower on the Lujiazui financial district site emerged as early as 1993, with a group of three towers; Jin Mao Tower (1999) and Shanghai World Financial Center (SWFC) (2008) comprising the two "sisters" of a "three sisters" tower plan. Shanghai Tower completed in 2015, but had

* Buildings must be fully clad and ready for occupancy in order to qualify as "complete" by CTBUH criteria, and to be officially entered into height rankings.

trouble attracting tenants prior to obtaining the necessary permits from the local fire department, and the consequent official occupancy permit, which was eventually obtained in June 2017.

Prediction 2

"We can predict that in a mere two decades (2000–2020), the height of the 'World's Tallest Building' will have more than doubled."

Reality

The World's Tallest Building(s) in 2000 were the Petronas Twin Towers in Kuala Lumpur, which rise to 452 meters, each. In 2020, the Burj Khalifa remains the World's Tallest Building at 828 meters (and has been since 2010), which is 1.8 times the height of the Petronas Twin Towers.

What Happened?

This statement was predicated on the assumption that the Kingdom (Jeddah) Tower would be complete at more than 1,000 meters' height by 2020. Still, "*nearly doubling in 10 years*" is also a pretty impressive statistic, considering that it took more than 60 years for the height of the World's Tallest Building to double previously. New York's Metropolitan Life Tower was the World's Tallest Building from 1909 to 1913, at 213 meters. The Sears (now Willis) Tower in Chicago, completed in 1974 rises to 442 meters, 2.1 times the height of Metropolitan Life.

Prediction 3

"China will have 10 of the world's 20 tallest buildings in 2020."

Reality

In 2020, China has 13 of the world's 20 tallest buildings. The building boom was even more robust than predicted in 2012.

What Happened?

Several of the buildings predicted to be in the "20 in 2020" list which did not complete were outside of China, allowing several more Chinese buildings to fill in the ranks. These include Jeddah Tower, Seoul Light DMC Tower, and Signature Tower, in Saudi Arabia, South Korea and Indonesia, respectively.

Here are the fates of the Chinese buildings in the 2012 study that have not yet been discussed:

Goldin Finance 117, Tianjin

- Predicted 2020 rank in 2012: 9 (597 m)
- Actual rank in 2020: n/a

Starting construction in 2009, and topping out in 2015, Goldin Finance 117 was expected to complete in 2016 (Qin 2015) (see Figure 3). Construction has stagnated since, with financial struggles affecting the developer due to difficulties leasing space in advance of completion. Rumors continue to circulate that Goldin lost ownership of the building after the company was privatized in 2016, but these claims have been denied (Week in China 2018).

Guangzhou CTF Finance Centre, Guangzhou

- Predicted 2020 rank in 2012: 13 (530 m)
- Actual rank in 2020: 7 (530 m)

Guangzhou CTF Finance Centre was completed in 2017, and is currently tied with its sister building, Tianjin CTF Finance Centre, Tianjin, for the rank of world's seventh-tallest building.

Tianjin CTF Finance Centre, Tianjin

- Predicted 2020 rank in 2012: 14 (530 m)
- Actual rank in 2020: 7 (530 m)

Tianjin CTF Finance Centre was completed in 2019, and is currently tied with its sister building, Guangzhou CTF Finance Centre, for the rank of world's seventh-tallest building.

Dalian Greenland Center, Dalian

- Predicted 2020 rank in 2012: 15 (518 m)
- Actual rank in 2020: n/a

Dalian Greenland Center began construction in 2014, and is currently "on hold."

Kaisa Feng Long Centre, Shenzhen

- Predicted 2020 rank in 2012: 19 (500 m)
- Actual rank in 2020: n/a

Figure 3. The Goldin Finance 117 tower began construction in 2009, and was expected to complete in 2016 (left). Construction reached the topping-out level but has stagnated since (right). © P & T Group (left); Goman Ho (right)

Shortly after site preparation began, the project was abandoned in 2013, after details of the transfer of land use rights were released (Shenzhen Land and Real Estate Trading Center 2013). A reduction in height down to 450 meters came the next year, per the Shenzhen Municipal Planning and Land Resources Commission (2014). New developers began bidding on the site in 2015 (Chiang 2015). Construction began again in 2016, but with a significant height reduction, with the building now planned to rise to between 200 and 260 meters (Deng 2016, Kaisa Group 2020).

Prediction 4

"South Korea could potentially have three of the 20 world's tallest buildings in 2020."

Reality

South Korea has one of the world's 20 tallest buildings in 2020, Lotte World Center in Seoul (555 meters). It is currently the world's fifth-tallest building.

What Happened?

The aforementioned Seoul Light DMC Tower never began construction, and the Busan Lotte Town Tower (510 meters; Predicted 2020 rank in 2012: 17) began construction in 2012, but stopped in 2013 for economic reasons and was never completed.

Prediction 5

"Saudi Arabia will have two of the world's 20 tallest buildings in 2020."

Reality

Saudi Arabia has one of the world's 20 tallest buildings, the Makkah Royal Clock Tower Hotel (601 meters; Predicted 2020 rank in 2012: 8; Actual 2020 rank: 3) in Mecca (see Figure 4). Originally planned to reach 734 meters in 2006, the final 601-meter height was revealed in 2009. Construction had begun in 2002, following the controversial demolition of the historic 18th-century Ottoman Ajyad Fortress on the site (Howden 2006). Throughout construction, several delays occurred, including two fires in 2008 and 2009 that impacted the construction schedule (Sheqdar 2009).

Figure 4. Makkah Royal Clock Tower, Mecca, was eventually completed in 2012, although at a shorter height than originally intended.

What Happened?

As mentioned above, Kingdom (Jeddah) Tower (1,000+ meters) has not yet completed construction.

Prediction 6

"The United Arab Emirates (UAE) will have two of the world's 20 tallest buildings in 2020."

Reality

The UAE has the world's tallest building, Burj Khalifa (828 meters), in Dubai.

What Happened?

The Pentominium, Dubai (516 meters; Predicted 2020 rank in 2012: 16) was proposed in 2006, began construction in 2008, but was placed on hold during the global recession of 2008-2009. Originally expected to complete in 2013, construction stopped in August 2012 due to the global financial crisis, when Trident International Holdings, its developer, fell behind on payments for a US$20.4 million loan (Duncan 2015). The Dubai Land Department is still seeking a serious developer interested in taking over the project.

Prediction 7

"Asia will house 70 percent of the world's 20 tallest buildings in 2020 (14); the Middle East will have 25 percent (5) and North America will have just one building, and the only one in the western hemisphere."

> "In all, 10 buildings of 500 meters' or greater height have been eliminated from the Tallest 20 in 2020 list since the 2012 CTBUH projection."

Figure 5. Lakhta Center, St. Petersburg, was completed relatively rapidly, especially considering that its site and design changed dramatically. © Slava Korolev

Figure 6. Two megatalls on the boards in 2012 that have not yet been constructed: India Tower, Mumbai (left) and Signature Tower, Jakarta (right). © Milkomède (cc by-sa) (left); Smallwood, Reynolds, Stewart, Stewart (right)

Reality

Asia in fact has 16, or 80 percent of the world's 20 tallest buildings. The Middle East has two, or 10 percent; Europe has one, or 5 percent; and North America has one, or 5 percent.

What Happened?

Several buildings emerged onto the scene relatively quickly, announced after the publication of the 2012 article. These include The Exchange 106 in Kuala Lumpur (445 meters), proposed in 2015 and completed in 2019, to become the world's 20th tallest building. Lakhta Center in St. Petersburg (462 meters) was proposed in 2012 (see Figure 5). Completing in 2019, it is now the world's 14th tallest building, but it would have been off the Tallest 20 list in 2012, which ended with the Shanghai World Financial Center (SWFC) (492 meters) as the shortest building, with a predicted rank of 20. The SWFC's fate was anything but assured for more than a decade. Construction began in August 1997, it halted shortly thereafter due to the Asian financial crisis. Only the foundations had been completed at that point. The project began construction again, six years later, in 2003, but underwent some major design changes after critics said the 50-meter-diameter hole through the tower's peak resembled Japan's "rising sun" flag (CBS News 2005). The building had been developed by a Japanese company. The circular cut-out was replaced in favor of a trapezoidal slot. Its current rank in 2020 is 12.

In all, 10 buildings of 500 meters' or greater height have been eliminated from the Tallest 20 in 2020 list since 2012. Nine of these, discussed elsewhere, include: Jeddah Tower; Seoul Light DMC Tower; Signature Tower; Wuhan Greenland Center; Goldin Finance 117; Dalian Greenland Center; Pentominium; Busan Lotte Town Tower; and Kaisa Feng Long Centre.

Lastly, Doha Convention Center and Tower (551 meters) (Predicted 2020 rank in 2012: 11) which was proposed in 2005, began construction in 2007, and stopped construction in 2012, reportedly, like its brethren in Shenzhen and Wuhan, because it was discovered the building would impact flight paths for Doha International Airport (Construction Week Online 2012). Only its foundations were completed, and the site remains empty (CTBUH 2014).

Prediction 8

"South and Southeast Asia, including Indonesia, India, and Vietnam, seem ready to become one of the next centers of skyscraper construction."

Reality

In general terms, the statement is borne out. In 2010, Indonesia had 39 buildings over 150 meters completed. Between 2012 and 2020, 69 more such buildings were constructed, and in 2020, 21 more were under construction. In India, 13 buildings over 150 meters were in existence. Between 2012 and 2020, 58 buildings in that range were built, and in 2020, 17 more were under construction. In Vietnam, only one building of 150 meters' or greater height had been constructed by 2010. Between 2012 and 2020, 28 such buildings were built, and by

2020, five more were under construction (CTBUH Skyscraper Center 2020).

What Happened?

The specifics are, of course, muddier. The speculation in 2012 was referring partly to India Tower (700 meters) in Mumbai, which began construction in 2010 but never completed, and to the aforementioned Signature Tower in Jakarta (see Figure 6).

A broader statement, not to be taken as a prediction, can also be made. The economies of Southeast Asia are generally on the rise, after a fast start in the 1990s, only to be knocked off-kilter by the collapse of the so-called "Asian Tiger" economic bubble. In the interim, China steadily increased its investment in the construction of cities and infrastructure alike. Only in the last few years, as the Chinese economy appears to be cooling, has production of first cheap goods, then gradually higher-end items such as electronics, begun to shift to countries such as Vietnam. Additionally, that formerly war-torn nation has also seen surging tourism in recent years. Meanwhile, China has sought to expand its economic horizons abroad by exporting its construction expertise, including in tall buildings, to many of its neighbors. It stands to reason that these are at least a few of the factors accounting for the pace of construction in this region.

2020: Present Tense

As a testimony to the dynamism (and unpredictability) of the industry, in addition to the nine buildings that were eliminated from the 2012 predicted Tallest 20 in 2020 list, 11 buildings that were not anticipated in 2012 have now taken their place in the ranks (see Tall Buildings in Numbers, page 52).

Proceeding in order from tallest to shortest:

One World Trade Center, New York (541 meters, rank 6) The largest source of controversy during the realization of One World Trade Center, completed in 2015, was the redesign of its spire, originally set to be enclosed with a "radome" and have a smooth appearance, to instead have a spindlier look, with telecom equipment exposed (see Figure 7). This provoked the biggest media moment in CTBUH history, when the Height Committee ruled, to much controversy, that the object atop the building was in fact a spire, and would thus be considered in the calculation of its architectural height, which affixes its rank as the world's sixth-tallest building today.

CITIC Tower, Beijing (528 meters, rank 9), also known as "China Zun," named after the ceremonial vase whose shape was its inspiration, was proposed in 2012, after the original CTBUH study was published, and completed in 2018. This is a significant year for the building, as it has received a CTBUH Award of Excellence for Best Tall Building over 400 Meters (see page 42), and Wuren Wang, Vice Chairman and General Manager of CITIC Heye Investment Co., Ltd., is the recipient of the 2020 Fazlur R. Khan Lifetime Achievement Award.

TAIPEI 101, Taipei (508 meters, rank 10) was completed in 2004, replacing the Petronas Twin Towers of Kuala Lumpur as the World's Tallest Building. It held the title until 2010, when it was replaced by the Burj Khalifa in Dubai.

International Commerce Centre, Hong Kong (484 meters, rank 12), was already completed in 2012 but had not been in line to be one of the 20 tallest.

Lakhta Center, St. Petersburg (462 meters, rank 13) was proposed for its current site in 2012 and completed in 2019. An earlier version of the project called Okhta Center,

Figure 7. One World Trade Center, New York City, was originally conceived with an enclosure around its topmost projection, making the object more easily identifiable as a "spire" (left). CTBUH eventually ruled that the object as completed (right) was indeed a spire, giving it a 541-meter height and current rank as world's sixth-tallest building. © Skidmore Owings & Merrill/dBox (left); Pedro Szekely (cc by-sa) (right)

> “Petronas Twin Towers, Kuala Lumpur, held the title of World’s Tallest Building(s) from 1998 to 2004, but in 2012, were not expected to rejoin the ranks of the Tallest 20 by 2020–they are currently at rank 16.”

planned to be 396 meters tall, was proposed in 2005 for a contentious, historically significant site in the center of the city. It was later moved to a more remote location near the Gulf of Finland.

Unanticipated in 2012, and defying the trend indicated by many of its peers in this study, was the entrance of Vietnam into the Tallest 20, with the completion of **Vincom Landmark 81** (471 meters, rank 14) in **Ho Chi Minh City**, a fast-track project proposed in 2015 and completed in 2018, a blazing-fast rate in the skyscraper world (see Figure 8).

Figure 8. Vincom Landmark 81, Ho Chi Minh City, proposed in 2015 and completed in 2018, was constructed with stunning speed. © Atkins

Changsha IFS Tower T1, Changsha (452 meters, rank 15) is a mixed-use tower proposed in 2012, began construction in 2013, and completed in 2018. It contains the world’s fifth-highest restaurant, at 432 meters (see Journal 2019 Issue III, page 52).

Petronas Twin Towers, Kuala Lumpur (451.9 meters, rank 16) held the title of World’s Tallest Building(s) from 1998 to 2004, but by 2012 they were not expected to have rejoined the ranks of the Tallest 20 by 2020. Much-admired for their design, one can now say they have endured against their peers in other terms as well.

Suzhou IFS, Suzhou (450 meters, rank 18) had been proposed in 2010, but was too short to have been considered a candidate for the Tallest 20 in 2020 list in 2012. The mixed-use tower, also a 2020 CTBUH Award of Excellence recipient, finished in 2019.

Zifeng Tower, Nanjing (450 meters, rank 19) is another high-rise that was completed the year before the 2012 CTBUH study, but was too short to have made the predicted 20 in 2020 list. The tower is notable for its high-ceilinged hotel rooms with operable windows (see Figure 9).

The Exchange 106, Kuala Lumpur (445 meters, rank 20), like the Vincom Landmark 81 in Vietnam, was a comparatively rapidly constructed project that was not “on the radar” in 2012. It was proposed in 2015 and completed in 2019 (see Figure 10).

Conclusion

Tall building construction projects are measured in years, if not decades. As such, they are imperfect, lagging economic indicators, even though some analyses have taken their iconicity as talismanic. As many of the completed and incomplete projects have shown, tall building construction timelines are not always representative benchmarks for other tall buildings—there are simply too many regional and project-specific factors to graduate much beyond generalities—let alone broader economic trends. Of course, they are huge economic investments, and they remain significant as representations of humanity’s highest ambitions, which extend well beyond economic parameters. We can predict with some confidence, then, that people will be interested in the Tallest 30 in 2030, and beyond. ■

For a side-by-side look at the Tallest 20 in 2020 as CTBUH projected in 2012, against the reality in 2020, proceed to the Tall Buildings in Numbers study (see page 52). An interactive version of this report appears online at skyscrapercenter.com/tallest-in-2020. See how CTBUH has done with its 2020 predictions so far: skyscrapercenter.com/predictions-2020.

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Figure 9. Zifeng Tower, Nanjing. © Haha169 (cc by-sa)

Figure 10. The Exchange 106, Kuala Lumpur, was proposed in 2015 and completed in 2019. © Mulia Property Development Sdn Bhd

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