Engineers face new problems with taller buildings.

With an ever increasing population and more people moving to live in major cities the need to build higher buildings has literally skyrocketed. In 1913 the Woolworth Building in New York was the world's tallest building at 241 meters. Almost a century later the Burj Khalifa opened in 2010 with a record-breaking height of 830 meters. Just 10 years before that the tallest building in the world was the Petronas Towers at just 452 meter. Construction of a building higher than a kilometre is ongoing in Saudi Arabia.

Engineers have often designing buildings from a structural point of view, that is, making sure that buildings do not collapse. With taller and more slender buildings a new problem arise. When subjected to a sideway force, most commonly the wind, tall buildings begin to sway back and forth, much like a flagpole would. If a building sway too much the habitants may experience symptoms similar to sea-sickness, such as nausea. With this in mind it has become necessary to determine how fast a building is allowed to sway, a hard task since people react very differently to a building's motion.

Furthermore, engineers have for long been helped by a set of rules set by government and professional institutions, known in Europe as Eurocode. With supertall buildings being built predominantly in American and Asia, Eurocode is not updated to accommodate problem with buildings swaying too much. Although some recommendations are given in Eurocode, they are limited to the use with buildings not taller than 200 meters. However, since most buildings codes used across the world are based on the same principle when it comes to estimating how much a tall building would sway in the wind, using Eurocode as a baseline with some modifications from other international building codes can give engineers an initial idea on how whether the finished building will move so much that occupants will be disturbed by it or not.

With buildings becoming taller more and more complex calculations can take long time to perform, even when done on a modern computer. This is especially true when forces acting during longer periods, such as wind-forces acting on a building facade, are to be simulated. A method developed by researchers that can be used when performing computer analysis of such complex buildings as supertall buildings is simply assuming the shape of the building when wind-forces act on it. Anyone that has ever seen a flagpole or a tall tree move in the wind can also picture a tall building moving in the same way. By using this assumption engineers can significantly reduce analysis times without losing too much accuracy in the results.