A study of Integration of Natural Ventilation to Office Building Typology using Computational Fluid Dynamics Workflow

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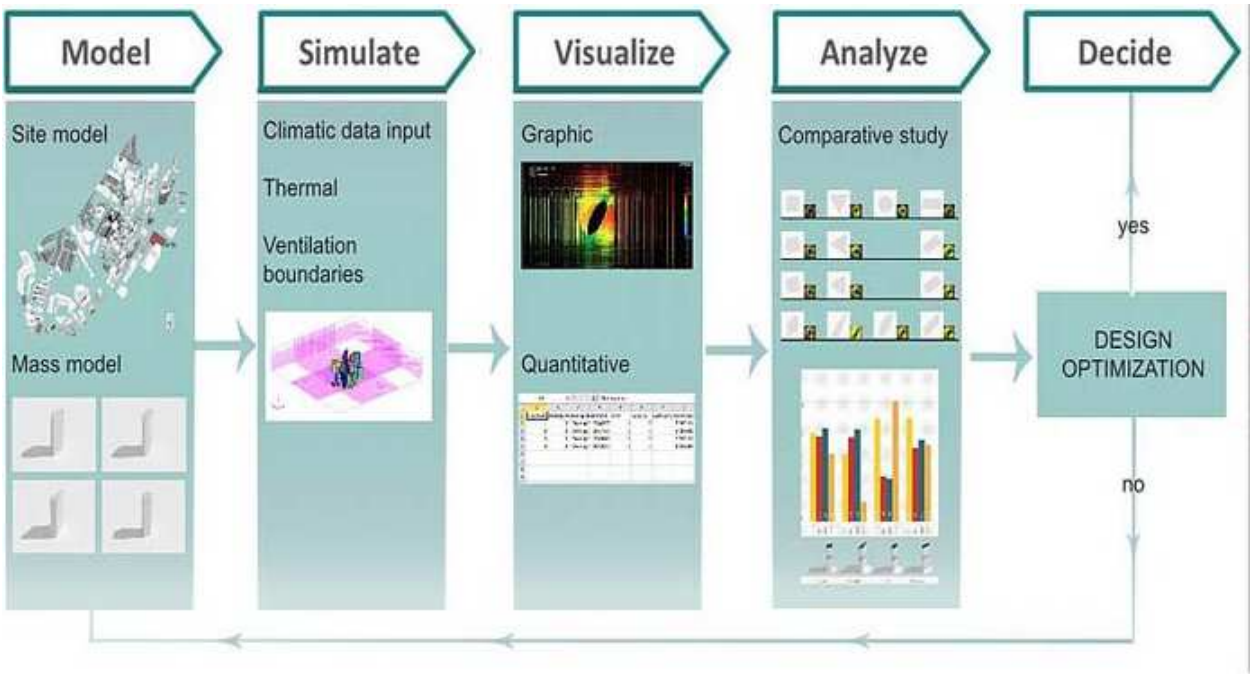
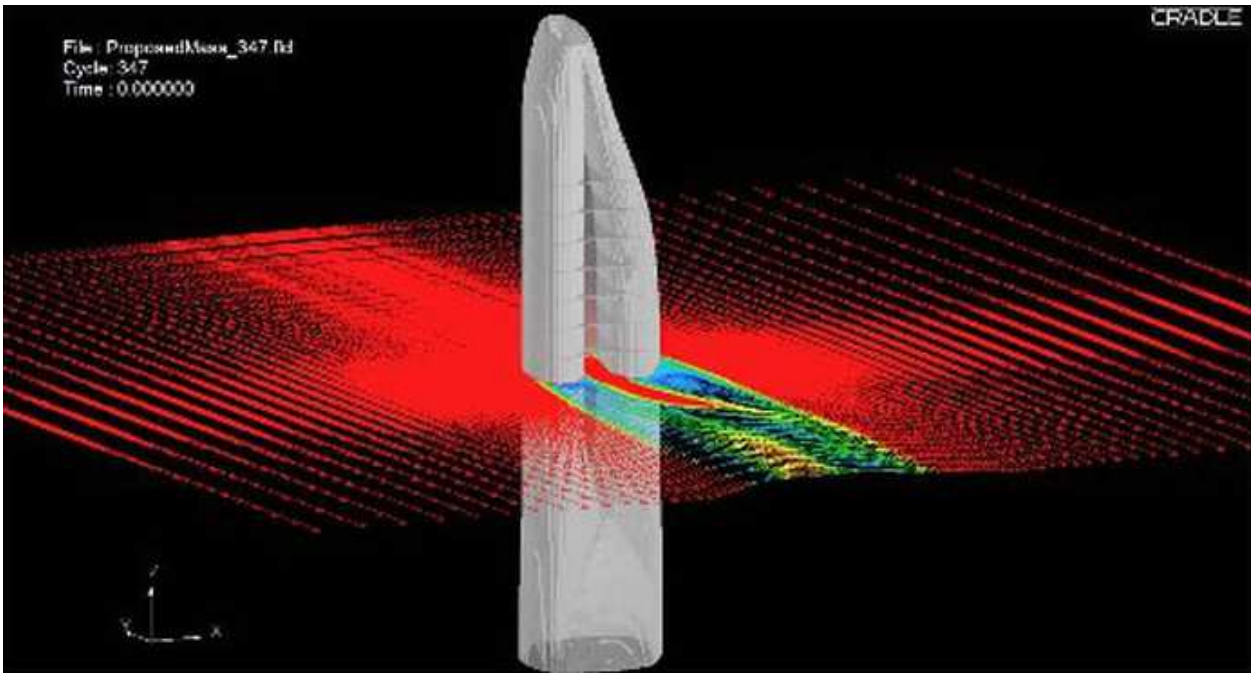
In this study, the integration of natural ventilation techniques is proposed as a solution to the problems of tall office buildings in tropic. Issues such as the over reliance on active systems as well as urban heat island effect, developed with the evolution of these glass box buildings. It is an issue that requires a paradigm shift in perspectives when it comes to designing for sustainability.

This proposed methodology presents the application of CFD, which was predominantly an engineering tool, for modelling wind environmental conditions around a variety of building configurations. Using the software CRADLE by scStream, the simulations of the iterations can be illustrated through visual interpretations of air temperature, surface temperature, pressure difference, and wind velocity around a single building or flow between multiple buildings. Building forms will be optimized in more aerodynamic, in which CFD acted as a quantitative tool to justify how wind was able to flow through and around the form without losing much speed, or being deflected in opposing directions. These were hence the transformation techniques used for "sculpting" an optimized form for the proposed NV tower block.

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CRADLE