ADIC Future Solar Responsive Façade

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Abstract
In this paper we describe using responsive kinetic shading screens as a solution to treat glass facades subject to high solar exposure.

The chosen case study is based on an international competition won by Aedas Architects in 2007 to design a worldwide unique landmark development for the Abu Dhabi Investment Council New Headquarters (ADIC HQ) in Abu Dhabi – United Arab Emirates. The office twin towers will stand 150 meters high and are due to completion in 2012.

Islamic & Regional Architecture, Sustainable Technology and Inspiration from Nature form the triangular foundation of the design concept of the Abu Dhabi Investment Council New Headquarters.

For centuries people of the Region designed and built sustainable buildings able to provide comfortable spaces under the harshest weather conditions. The philosophy however carefully avoids mocking traditional architectural styles or directly mimicking systems in nature but rather deriving methodologies to enhance the performance of contemporary buildings in similar conditions. The power of the concept lies in the algorithmic rules developed via computation to integrate the design principles and generate a building
That reacts, responds and adjusts to its changing environment.

A relatively clear glass curtain-wall forms the weather-tight layer of the towers’ skin. A secondary veil comprises intelligent automated shading components – opening and closing via centrally located linear actuators – linked back to a computerized control system that follows the sun path. The shading veil acts like a dynamic ‘Mashrabiya’ (Wooden lattice shading screen particular to the Middle East). The dynamic screen will reduce solar gain and solar glare while providing better visibility by avoiding dark tinted glass and blinds distorting the appearance of the surrounding view. This intelligent system will better distribute natural diffused light and optimize the use of artificial lighting and reduce air cooling loads. The system will help reducing the overall energy consumption, carbon emission, and plant room size.

If ADIC successfully meets the performance criteria projected by the Design Team and Client’s aspiration, it may very well become a bench-mark for future projects to follow and will allow for others to build upon the current concept and offer further improvements. Just like any other technology, the more it becomes more popular and common, the more it becomes affordable and reliable!

**figure 1.** The Abu Dhabi Investment Council HQ.