I've heard that the QNCC is built to LEED standards. What is LEED?

The Qatar National Convention Centre is a very large cutting edge facility that demonstrates a world-first green technology mindset. This venue is the first of its kind designed and being built to achieve gold certification of the U.S. Green Building Council's Leadership in Energy and Environment Design (LEED).

LEED is an internationally recognized green building certification. LEED provides verification that a building was built by using strategies to improving the usage of metrics that matter the most: Energy Savings, water efficiency, reduced co2 emissions and improved indoor air quality.

The QNCC LEED certification is expected to be completed by early 2012.

Qatar National Convention Centre (QNCC) Electricity Fact Sheet

The QNCC is a massive building it must use a lot of energy to cool the building down?

The exhibition halls are large spaces designed for 5000 people per hall (the entire facility is designed for a maximum of 35 000 people). The majority of the meeting room and administrative spaces are cooled using central variable air volume (VAV) air handling units. The VAV air handling units vary the amount of supply and primary air delivered to a space based on the space's cooling load. As the internal load decreases, the amount of air being supplied is reduced. Turndown of fan and pump motor speeds to match the cooling of loads of the spaces reduce the energy otherwise required maintaining thermal comfort levels within recognized standards. Also, the large Exhibition halls also use a temperature stratification strategy. Since all of the people and activity occur in the lower four meters of vertical space, the upper portion of each hall is not air conditioned to so air conditioning is provided to just what is needed to maintain the lower (occupied) portion of each hall. Stratification of the exhibition halls reduces the airflow (and associated energy) while maintaining the occupied space temperature at the desired set-point, by allowing an increase in the return air temperature.

Air Handling Units are equipped with Energy Recovery Wheels. These devices will extract valuable cooling and or heating energy from the building exhaust air and transfer it to the incoming fresh air system. This energy savings method reduces the building energy consumption by a minimum of 20%.

What renewable energy does the building make use of?

The sun is a primary source of energy on site; photovoltaic (PV) solar panels were installed to capture some of the energy requirements for the venue. There are three row array covers approximately 7080 sq meters of the roof, and produces 734kw. The PV panels will contribute 12.5% of the total energy consumed.

Qatar National Convention Centre (QNCC) Water Efficiency Fact Sheet

Given Qatar is such and arid country, how would QNCC promote water use efficiency?

Drinking (portable) water is a precious resource in Qatar. The majority of the water used in Doha comes from desalination facilities; conserving this resource is a priority and contributes to saving energy beyond the facility. The design of the facility pursued multiple areas of water use reduction – using water efficient landscaping, not using portable drinking water for landscaping, using of water efficient fixtures throughout the facility and capturing grey water from fixtures in Landscaping. The QNCC extension project includes the collection, filtering and treatment of grey water on site. Water usage was further reduced by making use of flow water fixtures, reduced flow water urinals, low flow urinals.

Is different approaches designed to water specific plants?

Yes, four different associations were designed.

- Native or adapted perennial and shrub bed associations are watered high efficiency drip irrigation, which applies water slowly and directly to the roots of plants using 30%-50% less water than baseline case shrub sprays.
- Tree well associations are watered with root watering zone products to provide water directly to the root areas reducing evaporation loss typical of surface watering products.
- Native/adapted turf areas are established around the green roof and beamed areas. These associations are watered with quick couplers for regular watering operations during initial establishment. This practice will be suspended after one year; however, water is required during the period of initial establishment. Maintenance of these areas is limited to mowing operations once each quarter.
- The final association is the turf areas. This association is highly limited throughout the site; the spray equipment selected utilizes high efficiency nozzles which eliminate overspray and applies water uniformly.

How is the irrigation system managed?

The irrigation system is further enhanced by its central control , which is programmable software package which has the ability to adjust run-times based on current and measured evaporation and plant transpiration losses as well as applying water at the rate soil can absorb on various slopes throughout the site.

It sounds like a lot of grey water is being used for irrigation purposes, how is grey water filtered/treated?

The grey water is collected and diluted with non-portable water supplied from the Education City's irrigation system, and then disinfected and recycled using macro and nano filtration technology. The grey water then passes through UV (Ultra Violet) filter units and is transferred to a final storage tank and dosed with small amounts of chlorine for disinfection. Final pumps supply the treated and disinfected water to into the re-use water distribution system for use in water closets and irrigation supply.

What has been done to reduce sanitary waste "Black water"?

The 50 % reduction in sanitary waste water drainage has been accomplished with the use of reduced flow water fixtures like low water closets, low flow urinals, low flow lavatories, and capture of the drainage water from the lavatories, referred to as grey drainage water. This reduces the waste water generated by the facility and portable water demand.

Water Management Systems

The building is equipped with a modern hot water system generating plant consisting of multiple electric boilers piped in a reverse return supply water method. This energy efficient measure allows an even distribution system maintaining a constant hot water distribution. A hot water return system and automatic mixing valves provide instant, pre-mixed hot water to all the public lavatories. This method minimizes the water usage by eliminating the usual waiting time for water to achieve the desired temperature.

Qatar National Convention Centre (QNCC) Air Quality Fact Sheet

What air-control/reduction systems have been included to improve the indoor environment?

The majority of the meeting room and administrative spaces are cooled using central variable air volume (VAV) air handling units. The VAV air handling units vary the amount of supply and primary air delivered to a space based on the space's cooling load. As the internal load decreases, the amount of air being supplied is reduced.

Each Exhibition hall is cooled using four constant volume air handling units (AHU's) and depending on the number of people present or level of activity during an event, all or half of the AHU's could be operating in each hall.

The large exhibition halls also use a temperature stratification strategy. Since all of the people and activity occur in the lower 4 meters of vertical space, the upper portion of each hall is not air conditioned, so air conditioning is provided to just what is needed to maintain the lower (occupied) portion of each hall.

The facility also uses centralized dedicated outside (fresh) air units. All of the fresh air supplied to the building is conditioned within these central units and then supplied to the various building AHU's serving the individual spaces. When the rooms are not occupied or have low activity, the amount of fresh air from the central outside air units can be reduced using demand control ventilation.