

Environment Summary of Trends and Findings

Trend 1: There is increasing urgency in the recognition of the need to make significant changes to maintain the ability of the Earth to support its human population.

- The Earth Policy Institute (Brown, 2011) identifies several factors that combine to present environmental challenges to the ability of the Earth's environment to support life: exponential population growth; depletion of aquifers in heavily populated areas; depletion of other natural assets (including forests, grasslands, and soils); and climate change causing increased incidence of drought, which reduces grain harvests, leading to rapid increases in food prices.

This has significant implications for social and economic stability. Since 70% of world water use is for irrigation, water shortages translate into food shortages. Most of the top 20 countries considered to be "failing states" are depleting their natural assets (including aquifers, forests, grasslands, soils) to sustain their rapidly growing populations.

- Four key actions are needed to address these environmental challenges, what Brown (2011) calls Plan B. First, stabilize climate through an 80 percent reduction in carbon dioxide (CO₂) emissions by 2020 by increasing the efficiency of the world energy economy, replacing fossil fuels with renewable energy, and ending deforestation while planting trees. Second, restore the earth's natural support systems: reforestation, soil conservation, fishery restoration, and aquifer stabilization. Third, stabilize population through a shift to smaller families, and fourth, eradicate poverty, which will be helped significantly by lower population growth.

Brown (2011) argues that the funding needed to restore the earth's natural systems, stabilize population and eradicate poverty is under \$200 billion per year, which could come from a reallocation of national security funding to recognize these new, major threats to our security.

Trend 2: Environmental sustainability is a growing issue for colleges and universities.

- Higher education institutions "hold a unique position in society, as they have the potential to promote and encourage societal response to sustainability challenges facing communities around the world through interactions of thousands of individuals on campus and outreach to millions" (Waheed et al., 2010, p. 720).
- Colleges need a vision of a sustainable future to guide all facility development, including renovation of existing buildings, design and construction of new buildings, facility operations and maintenance, campus land use and outdoor recreation (U.S. Department of Energy, 2003). The *primary objectives* of this vision should include: (1) site/master planning that specifies goals of water independence and increased biodiversity; (2) reducing energy use for both new and existing buildings, and optimizing use of renewable energy sources; and (3) enhancing indoor environmental quality. Benefits of a vision of a sustainable future include reduced operating costs; reduced resource consumption; reduced site disturbance/site

restoration; improved health and productivity of students, faculty and staff; increased quality of life for community; and positive contribution to the surrounding natural environment and community.

- Colleges should start their implementation of a sustainable future by establishing baseline data for all campus energy use (U.S. Department of Energy, 2003).
- The University of San Diego (USD) partnered with AMSOLAR to install 5,000 solar panels that will generate 1.23 megawatts of renewable energy and meet 15% of USD's energy needs. Federal stimulus grant funds were used to cover the initial costs (Corpuz, 2009; Roscorla, 2009; Shallat, 2009)

Trend 3: The availability of water is an issue of growing concern in San Diego.

- In San Diego County, water use during fiscal year 2008 was 692,000 acre feet. If this amount, 59% was used in residential settings (with over one-half of this for landscaping), 18% was used in commerce and industry, 13% was used for public spaces, and 12% for agriculture (Guerrero & Haggard, 2009).
- Rainfall contributes 10-20% of San Diego's water supply. The remaining 80-90% of water used in San Diego is imported from two sources: the Colorado River, through a 242 mile-long aqueduct, and from Northern California through the 444 mile-long California Aqueduct (Guerrero & Haggard, 2009).
- The San Diego County Water Authority (SDCWA) is actively promoting water conservation education and using incentive programs to encourage voluntary water conservation. The San Diego region is increasingly focusing on desalinization technology and using recycled water for irrigation. SDCWA is a world leader in using technology to monitors pipes for leaks.

Trend 4: There is growing investment and development of the sustainable energy sector.

- In response to perception of a world-wide race to develop clean energy technologies, the U.S. Department of Energy is increasing its budget for research in renewable energy technologies, including solar, wind, geothermal and electric vehicles. Department of Energy support for research and development in hydrogen and fuel-cell technology and fossil-fuels is weakening, although these budgets are still as big as those for solar energy (Johnson, 2011).
- The San Diego region has a strong environmental technology industry cluster made up of small and medium-sized water technology companies (Guerrero & Haggard, 2009).
- The federal Bureau of Labor Statistics and many state labor information departments are now undertaking studies of the labor market in green jobs and sustainable industries. The Workforce Information Council (2009) proposed the following working definition of a green job: "A green job is one in which the *work is essential* to products or services that improve energy efficiency, expand the use of renewable energy, or support environmental sustainability."

Potential Impacts:

- Water and energy shortages will impact the entire district. The availability of water is the issue that will most determine the future of Southern California.
- There will be a demand for intelligence capital to fuel innovation in sustainability, accompanied by a demand to prepare more students for science careers.
- The government will encourage the development of “green” energy and will continue to research and fund new source of energy outside of oil.
- GCCCD may be tempted to overemphasize preparation for alternative fuel careers.

Recommendations:

- Gear the entire focus of campus towards a sustainable future (from the Chancellor to the students)
- Immediately begin scientific measurements of energy/water usage on campus to provide a baseline for future reference.
- Implement a framework to assess how well the district is moving towards a “sustainable” campus. An assessment model must be put in place to evaluate the sustainability of every facet of district operations, including facilities, hiring trends, and curriculum.
- The district must lead the community into a more water-wise future. The district must take action, including conserving water by planting drought tolerant landscapes, closely monitoring pipes for leaks, and using recycled water for irrigation.
- Faculty need to build “water issues” into the curriculum and prepare students for an environment in which knowledge of water processes and planning strategies will make them highly valued employees.
- GCCCD could benefit from organizing a community-wide, on-campus conference focused on moving towards a sustainable campus to the ultimate benefit of the community, students and faculty