Energy on Campus: Education & Workforce Training for Environmental & Sustainability Management

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Biology is the “Study of Life,” the Biosphere

www.sustainabilityma.org SMA in 20 US states, 8 countries.

Wind Turbine Project

Save the Date!

TRACS
Texas Regional Alliance for Campus Sustainability

5th Annual TRACS Summit
March 5-7, 2017
at Texas A&M Commerce

Texas (and Mexico!) Higher Education Collaboration
PRESENTATION OUTLINE

I. WHAT IS ENVIRONMENTAL OR SUSTAINABILITY MANAGEMENT?
II. GLOBAL TRENDS IN ENERGY & BUILDING CERTIFICATION
III. TEXAS HIGHER EDUCATION – ENERGY BUDGET AND USAGE
IV. DCCCD – SUSTAINABILITY MANAGEMENT, EDUCATION & WORKFORCE
V. NORTH LAKE COLLEGE (DCCCD) – CAMPUS PROJECTS & MASTER PLAN
WHAT IS ENVIRONMENTAL & SUSTAINABILITY MANAGEMENT?

- **Environment**
  - People, plants, animals, natural resources, and habitat/geographic conditions

- **Sustainability**
  - Conservation for future generations
  - Triple-bottom-line = economy, environment, society

- **Management**
  - Ongoing process of communication & strategic decision-making for use of resources (“control”)

- **Triple-Bottom-Line Management**
  - Profit = capital resources
  - People = human resources
  - Planet = natural resource
GLOBAL TRENDS: ENVIRONMENTAL & SUSTAINABILITY MANAGEMENT

POLICY & BUILDING CERTIFICATIONS

• “ENERGY PERFORMANCE CERTIFICATION OF BUILDINGS” REPORT BY THE IEA
• EU ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (EPBD) -- HTTP://WWW.EPBD-CA.EU/
• CITY OF AUSTIN GREEN BUILDER PROGRAM (RECOGNIZED IN 1991)
• BREEAM HAS CERTIFIED ~2,253,470 BUILDINGS IN 77 COUNTRIES (HTTP://WWW.BREEAM.COM/)
• USGBC HAS CERTIFIED ~458,700 BUILDINGS/HOMES IN 162 COUNTRIES (HTTP://WWW.USGBC.ORG/ARTICLES/USGBC-STATISTICS)

EDUCATION & WORKFORCE TRAINING

• UNESCO TVET – TECHNICAL & VOCATIONAL EDUCATION & TRAINING (TVET)
• PARIS AGREEMENT – INVOLVES ENERGY RESEARCH COLLABORATION
STRATEGIC ENERGY MANAGEMENT CHECKLIST

https://ecenter.ee.doe.gov/EM/SPM/Pages/SEM_home.aspx

- Receive SEP certification
- Obtain third-party verification
- Achieve energy performance improvement targets
- Conduct rigorous measurement & verification of energy performance

ISO 50001
Standard Energy Management System (EnMS) framework for global industrial operations

- Receive ISO 50001 certification
- Achieve ISO 50001 EnMS
- Management reviews
- Conduct internal EnMS audit
- Formally document EnMS

Foundation Energy Management
(e.g., ENERGY STAR for Buildings & Plants)
Fundamental approach to developing a systematic energy management program based on industry best practices and benchmarking tools

- Re-assess
- Evaluate progress
- Implement plan
- Create action plan
- Set goals
- Baseline energy performance
- Establish energy policy
TENNESSEE HIGHER EDUCATION: ENVIRONMENTAL & SUSTAINABILITY MANAGEMENT

- **2007 – HB 3693** – ENERGY EFFICIENCY BILL, 5% ENERGY REDUCTION ANNUALLY FOR HIGHER EDUCATION AND SCHOOL DISTRICTS
- **2013 – SB 700** – EPA ENERGY STAR PORTFOLIO MANAGER AS TOOL FOR STATE-WIDE REPORTING BY HIGHER EDUCATION
- **2016 – SECO** ESTABLISHED ASHRAE 90.1-2013 MANDATORY FOR ALL PUBLIC BUILDINGS
- **AASHE, SECOND NATURE, & TRACS** – [WWW.TEXASCAMPUSSUSTAINABILITY.COM](http://WWW.TEXASCAMPUSSUSTAINABILITY.COM)
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<th>Year</th>
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<td>University of Texas Health Science Center at Houston</td>
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Texas Higher Education Energy Budgets
17 schools = $48.6 M spent on electricity
Texas Higher Education Electricity Usage
17 schools = 1,827,248,289 kWh or ~210 MW/YR

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<th>Electricity Usage (kWh)</th>
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DCCCD: ENVIRONMENTAL & SUSTAINABILITY MANAGEMENT

- DCCCD BEST PRACTICES IN SUSTAINABLE FACILITIES AND OPERATIONS, ESTABLISHED IN 2015
  - HTTPS://WWW.DCCCD.EDU/AU/CHANCELLOR/ORGLEARN/COUNCILS/WG/DCCCDGREEN/PAGES/BPRACTICES.ASPX
- DCCCD SUSTAINABILITY POLICY, DRAFT IN PROGRESS

SUSTAINABLE DCCCD STRATEGIC GOALS:

1) THE CONSERVATION OF ENERGY AND RESOURCES
2) MINIMIZING WASTE
3) EDUCATING OTHERS ABOUT SUSTAINABILITY AND, FINALLY
4) ENGAGING THE LOCAL, REGIONAL AND NATIONAL COMMUNITY ON SUSTAINABILITY EFFORTS.
DCCCD: EDUCATION & WORKFORCE

- **DCCCD SUSTAINABILITY EDUCATION TASK FORCE**
  - Sustainability Scholars Programs – 3 to 5 courses + any associate degree
  - NLC SAGE Scholars – Sustainability Awareness & Global Education

- **Cedar Valley College, Lancaster/Dallas** – Commercial/Residential Building Performance

- **North Lake College, Irving/Coppell** – Commercial/Residential Construction

- **Eastfield College, Mesquite** – AAS & Certificate in Renewable Energy Technology
North Lake College
DALLAS COUNTY COMMUNITY COLLEGE DISTRICT

• ~28,000 STUDENTS (80% PART-TIME)
• ~1,200 EMPLOYEES (70% PART-TIME)
• AA, AS, AAS, CERTIFICATES
• ARTS (FINE, PERF., LIBERAL)
• BUSINESS & REAL ESTATE
• COMPUTER SCIENCE
• CONSTRUCTION
• FIELD STUDIES
• LOGISTICS MANAGEMENT
• SAGE SCHOLARS
• STEM
North Lake College (DCCCD):
Environmental & Sustainability Management

- Sustainability Commitment and 6 KPI’s
- 3 USGBC-LEED Silver Buildings
- EMS (Siemens)
- 2030 Master Plan in Progress – Academic & Infrastructure
  - Renewable Energy Plan
- $7M Projects Since 2011, Average ROI $1.8/Year
  - LED Lighting Retrofits
  - Solar Exterior Lighting
  - Computerized Irrigation Controls
NORTH LAKE COLLEGE IN TOP 20 “MATRIX PROJECT”
AASHE – KIMBERLY CLARK SUSTAINABLE CAMPUS COMPETITION

- **WWW.AASHE.ORG**
- ENVIRONMENTAL / SUSTAINABILITY DASHBOARD SOFTWARE (MORE COMPREHENSIVE THAN ENERGY DASHBOARD)
- DISPLAY SCREEN NETWORK
- AUTO SENSOR NETWORK
- LOCATIONAL MANUAL SENSOR LABS
- FACULTY STIPENDS
- STUDENT SCHOLARSHIPS
This view of the dashboard shows community-wide electricity use.

- Total city electricity use: 1,806.8 watts per person
- Electricity for water treatment: 24.4 watts per person
- CO2 emissions from electricity: 2.6 lbs CO2 per hour per person
- Air Temperature: 73.2 degrees F
E N E R G Y  O N  C A M P U S:

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