GREEN at the UNIVERSITY: Teaching Green by Being Green

Panelists:

- Paul Brunner  
  Indiana University Theatre & Drama
- Ellen E Jones  
  Bemidji State University
- James McKernan  
  York University
Teaching Green by Being Green

GREEN AT THE UNIVERSITY

Paul Brunner
Assist. Professor, Head of Theatre Technology

Teaching Sustainability by Practice

- No absolutes..no one “silver bullet” answer to all of our material needs.
  - Wheatboard…maybe…maybe not
    - Plagued with short harvest seasons, annual storage, product odor, quality control issues related to surface delamination
Indiana University Scenery

Encourage the application of a wide range of construction products and apply them to our theatrical construction tradition

Result = “Everything in moderation” approach

Promote Efficient Wood Use

- Pro-Wood
- Economical AND Ecological use of lumber and wood panel products
- Sustainable Scenery does NOT require enormous changes to current construction practices

Back to Fundamentals…
- Is it the practice of your workplace to first dig in the scrap racks?
Scrap Tips

- Is it clear and simple to view materials in your scrap racks?
  - Clean and organized scrap storage racks
  - Paint a bright color for visibility
  - Clearly labeled shelves or compartments

Don‘t be too negative

We already do a good job!

Theatrical Tradition of Reuse
- Platforms & legs
- Flats & Walls
- Slop Paint

This tradition comes from a decades long practice rooted in financial incentive. Reusing = lower cost of ownership. While motivation does not stem from “sustainability”, the result as an overarching sustainable approach to scenery.
Sustainable “Stock”

- Approach administrators for campus storage space for “stock” platforms, flats, stair units, etc.
- Package it as Sustainable Scenery, because it is!
- Our industry can be an example for Sustainability!!

Stage Scenery as a Model


Recommendations for Green Building Practices

1) plan rooms in four-foot multiples to accommodate standard-sized drywall and plywood sheets

2) Design structures to be recycle friendly and to accommodate disassembly once the building’s useful lifespan is complete.

And we can do more, and we can do better!
Wood Composites & Sustainable Wood Use

TD&T, Theatre Design & Technology, Fall 2009

- *Green Stage Scenery with Sustainable Wood Composites -- pg 24*

Sustainable Wood Products

Engineered Panels--Performance-Rated Products
- OSB – oriented strand board
- Plywood
- LVL, LSL, GluLam, Wood I-Joists, etc

Composite Panels –Non-structural Products
- Fiberboard
- Hard board – (masonite)
- Particle board
- MDF – medium-density fiberboard
MDF – the rising star

Roseburg, Plum Creek, Flakeboard R&D
- Lighter weight MDF
- MDF-Plywood Hybrids
- Ultra-thin MDF
- Neatflex MDF

Why Wood is Sustainable

- Global wood usage
  - 15% -20% to housing and furniture
  - 30%-40% to paper and pulp products for printing, packaging, and sanitary purposes
    - Half of this percentage comes from sawmill wastes
  - 50% is burnt
    - Heating & cooking in tropical developing countries, where over 3 million people depend on wood as the primary source of energy
    - Alternatives?

- Trees are 100% renewable!
Wood = Off-the-Shelf Sustainability

- Low Cost & Readily Available
- Composites Uses upwards of 95% of an entire tree
- LEED defines “renewable” only within a 10-year period

LSA – Life Cycle Assessment

- Examines the impact of a material from its creation to its disposal
- Wood = very little energy at all is used in the life cycle
- One of the chief indicators of overall environmental sustainability
- LSA for Steel framed home = 33% greater CO₂ emissions and 800% more water than with sawn dressed lumber
Why Wood is Sustainable

- Substitutes for Wood construction nearly always results in increased carbon dioxide emissions.

- Composite Panel Association (CPA)
  - Tree growth and planting exceeds harvests in all areas of North America
  - Tree harvesting is highly regulated and carefully administered
  - Trees naturally remove carbon dioxide from the air and lock it away in tree fibers. The Carbon is sequestered in wood.

Teaching Sustainability

- Promote Efficient and Ecological use of Wood
  - Entirely recyclable and Biodegradable
  - Renewable
- Wood Composites, particularly MDF are some of the most sustainable products available
- LSA of lumber = far better for environment than any other construction product
- Our forests, particularly in Canada, are highly regulated and well maintained
  - Tree harvesting is a very selective process
  - Many certified wood programs, including FSC.
Ellen E. Jones  
Bemidji State University  
Bemidji, MN

GREEN AT THE UNIVERSITY: TEACHING GREEN BY BEING GREEN

Areas of Approach

- Determine what you can control.
  - Catalogue what takes the most time.
  - Compute use of resources.
    - Energy consumption
    - Materials
    - Money, especially for labor and wasted supplies
Intersection of Safety and Environmental Stewardship

- Housekeeping is easiest starting point
  - If you can’t find it, you can’t reuse it
  - If you can’t store it without damaging it, you can’t reuse it
  - If it is stored in a way that allows vermin to house in it, you don’t want to reuse it
  - If you plan building so items can be deconstructed for reuse, it is easier to recycle or reuse it

Recycle and Reuse

- Using salvaged, loaned, or looted materials without any idea of condition, quality, strength or origin is not acceptable recycling or reuse— it is irresponsible!

- Turning an inappropriate object into a marginal version of what is needed is not responsible resource management.
Safety Standards

- If everyone is wearing PPE’s is that good enough for safety?
  - PPE’s are the least effective way to keep people safe because of the element of human responsibility
  - Recommendations:
    - Reengineer the Process so you don’t need hazardous materials.
    - Remember, anything potentially hazardous to students and workers is potentially hazardous to the environment

Note Bene:

- I am not suggesting to not provide or use PPE’s.
Hazardous Products

- There are identified governmentally identified hazardous materials and there are products that common sense can identify for us.
- Industries state they are doing everything possible to reduce hazardous waste as part of the required process to move it to satellite storage facilities. Why can’t we all do the same and start there?

Institutional Policies:

- Most schools have specific policies about hazardous waste disposal. Find out what they are and take advantage of the existing process.
- Think of everything you plan to dispose of as potentially hazardous and figure out how to reduce your entire waste stream.
- Used existing instructions for professional staff for the students.
Scene Shop Examples:

- No spray booth and appropriate respirators- No Spray Paint, Paint Thinner, Spray Glue or other chemical that requires respiratory protection. Reduces air contamination and need for specialized disposal of any chemicals.
- We use water based paints and sealers. We keep a light and dark slop bucket for back painting and base coating everything.

Costume Shop Examples

- We are in the process of using up all stocked laundry products and switching to safer ones:
  - Soap Nuts instead of Phosphate Detergent
  - Hydrogen Peroxide instead of Chlorine Bleach unless absolutely needed
  - Vinegar and Baking Soda instead of Perfumed Fabric Softeners or softener sheets
  - Making washable fabrics the first choice for construction when possible to avoid dry cleaning.
What are Soap Nuts?

Reducing Carbon Footprint

- Most utility companies are required to work toward sustainability
- Facilities Management may be another starting point.
  - Ask for audit
  - Grant availability
  - Rebates for changes
Bemidji State Example

- Replace older fixtures- grant from MN Pollution Control Agency top replace old units with Source 4 units
  - FOH potential use reduced by 10000 watts
  - Two other buildings made changes with fluorescent replacements
  - We are in the second phase of testing some LED lamps in house lights, over steps, and lobby.

EarthPAR 38

- Power Consumption: 15 Watts
- Light Engine: 1x15 Watt
- Input Voltage: 90~240 V AC (Worldwide)
- Luminous Flux: 800 Lumens
- Color Temperature: 3000 K (Warm)
- CRI: 75 (Typical)
- Beam Angle – 120 Degrees
- Lifespan: > 50,000 Hours (MTBF)
- Construction: Aluminum with Integrated Heat sink, Glass Lens
- Physical Dimensions:
  - Overall Length – 5.08 in (129.17 mm), Diameter – 4.78 in (121.87 mm)
  - Weight – 12 Ounces
- Base Types Available: E26/27
- Great For: Spotlights, Down Lights, Protected Outdoor Lighting

Cost to run for one year – $4.38
Calculated assuming 8 Hours a day operation, 365 Days a Year with $.10 KWh Electricity Cost
Costume Shop Example

- Used equipment money to replace vintage washer/dryer with high efficiency models with steam feature.
  - Reduced water consumption
  - Incidentally led to better use of student labor—fewer wash loads and less ironing

Scene Shop

- Planned Reuse beyond stock sized scenery requires thinking backwards in some ways and a team that allows for a more organic process.
  - May change construction techniques
    - Less glue and staples
    - Building in standard component lengths
  - May mean slight changes in the footprint of the set overall to integrate existing elements
Investing the students and school

- Involved students in the grant application process.
- Publicized the efforts and chose one show that was going to be as green as possible.
- Topic is included in both Lighting and Scenery Stage Craft syllabi.
- Part of the standard process in the shops

Man of La Mancha
To reduce storage space step units require, we switched from more standard carriages to these frames with \( \frac{3}{4} \) ply.

From Bill Raoul’s *Stock Scenery Construction Handbook.*
Green at the University
We found using cardboard on larger surfaces to be less successful.

Industry Partnerships

Partners in sustainability

James McKernan, Assistant Professor York University
Toronto, Canada
Goals of York FFA

Sustainability is seen as more than just the environment, it included being environmentally, educationally, socially and developmentally responsible.

Many of these initiatives are addressing many if these goals.

What York University is doing

• January of 2010 we held “Get the LED out”
• April of 2010 we held “Getting Out of the Fog”
• Hosted ETC Ion training sessions that our students and staff have benefited from
• In January of 2011 we are hosting a projection for the stage event
• Established a partnership with AC lighting
York University recently held an Sustainable Technology Forum to promote the use of LEDs. It is a very sustainable technology.

We at York U would like to thank:

- Robert Juliat
- ETC
- Horizon Solutions
- Erikson PRO
- Martin

Get the LED out was produced through their generosity
I have been developing a presentation for CITT events to highlight the good work toward sustainability that our industry partners are doing.
‘committed to fostering a healthy, safe and sustainable global environment.’

ETC meets and exceeds compliance with the European Union’s WEEE
(Waste from Electrical and Electronic Equipment)

Energy-saving ETC Selador™ LEDs take the stage at climate change summit, Copenhagen

Please visit the ETC website to learn more about their environmental policy:

• In 2007, ETC and its affiliates recycled:
  • 381,841 lbs (173,200 kg) of cardboard and paper
  • 416 cubic yards (318 cubic meters) of glass, plastic and cans
  • 275 gallons (1,041 liters) of oil
  • 14 units of computers, monitors and hard drives
  • 1,636 lbs (742 kg) of batteries, electrical scrap and power supplies
  • 730,788 lbs (331,480 kg) of steel, aluminum, copper and wire
Green at the University
aluPAR is an ECOLOGIC® product

At the end of life, the glass and aluminum are recyclable.
A Life Cycle Analysis of LEDs produced by OSRAM indicates that LEDs are much less harmful for the environment than conventional fixtures and fluorescents in the manufacturing, energy use and disposal stages of life.

To read more about the life cycle analysis go to: http://www.osram-os.com/osram_os/EN/index.html

Our goal is to create a forum for theatre artisans to become educated in more sustainable practices for the stage. This information will hopefully lead to an open innovation system that will help the theatre industry become more ecologically sustainable. As you find new sustainable practices please contact us so we can post it here along side our research.
Visit **Theatre Artisan Green Skills** for tips on greening your theatre like:

A paint prewash station to help keep latex out of the water table.

Easy to follow step by Step instructions

www.yorku.ca/tags

**Instructional video on how to re-skin a flat**

Visit the Theatre Artisan Green Skills website for resources like these.

If you have an idea for more resources like these please contact James McKernan at: mckernan@yorku.ca

www.yorku.ca/tags
This Type of partnering outside of the University helps us develop stronger relationships inside the University

The Greening of *Opera Erotique*  
creating sustainable ‘design on demand’  

June 2010  
A York University Research Project  
William Mackwood  
co-investigator: James McKeman  
co-investigator: Gwen Dobie
The entire rig fits in the trunk of a car

Partnering with

- We helped develop a series of 25 Colour Force 12s for our studio space
- We helped develop black light fixtures Colour Block 2s
Upcoming Projection Symposium

- Working with local suppliers to provide gear
- Students volunteering to get chance to use gear
- Designers talking about environmental, social and realities of projection in live performance

Upcoming Conference
Burton the Problem Child

Developing Curriculum

- Making sustainability a major part of design and construction considerations
- Class projects designed to change current methods
- Being realistic about short term and long term goals
- Start with teaching it in first year classes
MFA Sustainable Design 2011-2012

- Almost approved
- When it is we will be letting partners like the CSPA know a.s.a.p.
Thank You

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