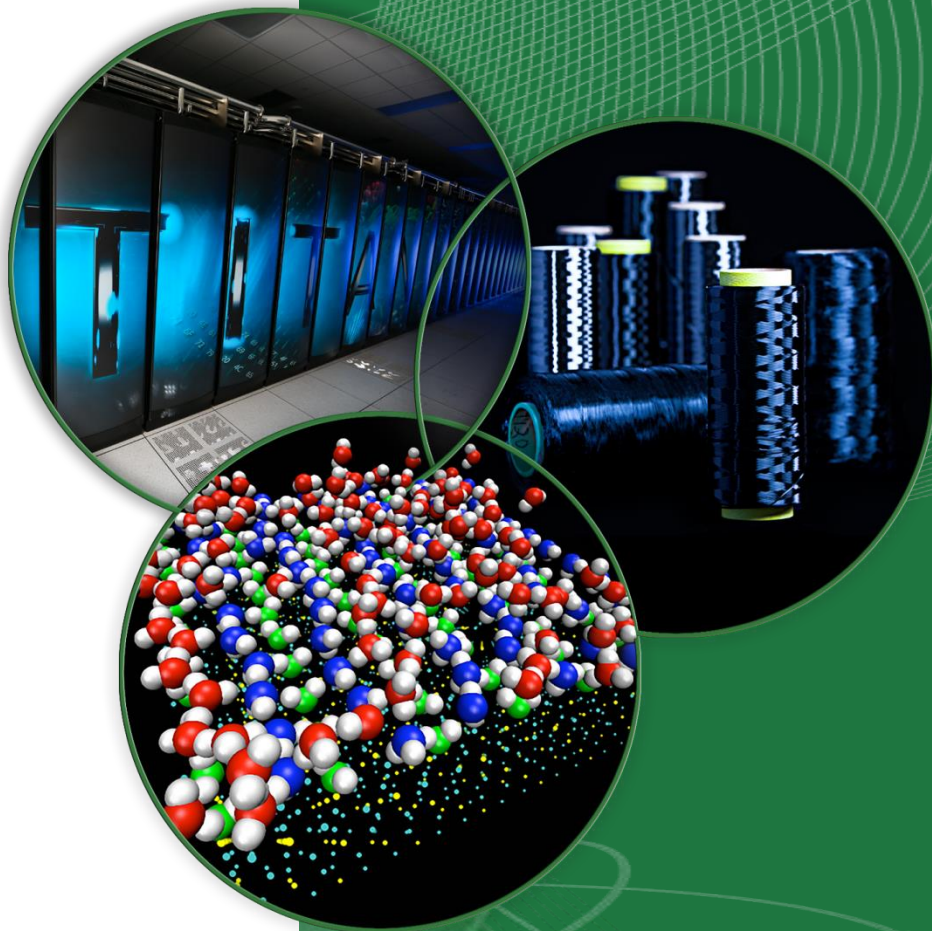


# Addressing fire risk in biomass handling and storage

Erin Webb

DOE Bioenergy Technologies Office  
Biorefinery Optimization Workshop  
Rosemont, IL  
October 5, 2016





# Government-Industry partnership

## Biomass Industry Panel on Codes & Standards



U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



**ABENGOA**

**POET**



**Vista Consulting Group**

## Objectives

- Understand fire behavior in biomass feedstocks
- Improve codes/standards to better reflect current knowledge of biomass fire risk and industry practices
- Develop training and reference materials for design professionals, code/standards developers, and code officials

# To date, 7 successful ICC fire and building change proposals

- Clarify that biomass is NOT a hazardous material
- Clarification to allow for large stacks and piles
- Add bioenergy feedstocks to wood chapters
- Add biomass categories for sprinkler design



## Proposal to add biomass to NFPA sprinkler discharge standard rejected

- *Prompted fire commodity classification tests*

100% success rate for IBC and IFC proposals.  
*Virtually unheard of!*



# Feedstock type and bale shape significantly impact fire growth



Stover rectangular bales



Switchgrass rectangular bales



Stover round bales



## Observations

- Switchgrass burns much better than stover
- Lower density of round bales enabled fire more access to O<sub>2</sub>
- After netwrap was burned away, outer layers of round bales fell away exposing fresh material to fire

**Based on these data, proposal to add bales stover and switchgrass to sprinkler discharge standard is in development**

# Next steps

## Fire risk in storage

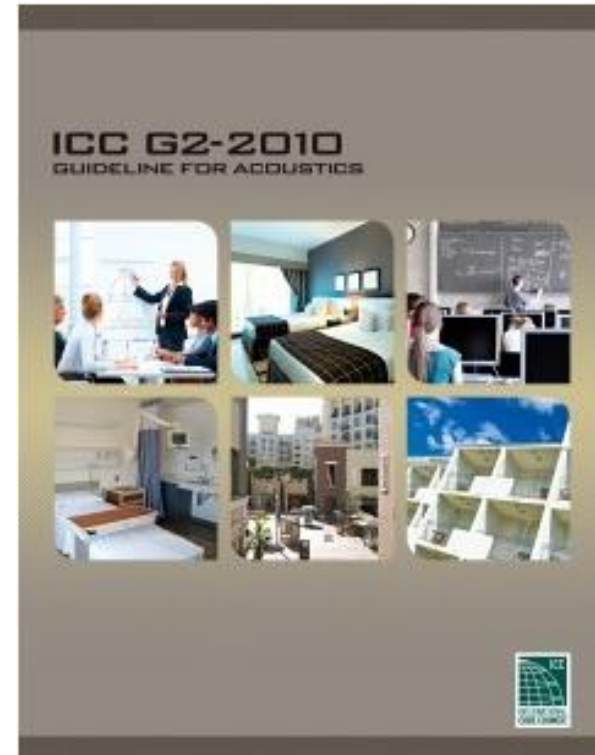
Working with industry to plan fire stack experiments for spring 2017



Corn stover, Moscow, KS  
(photo from: <http://biobasedchems.blogspot.com>)

## ICC Technical Document

Assist engineers and reviewers in applying Codes for biomass-handling facilities





# **Oak Ridge National Laboratory:**

**Discovery and innovation  
for clean energy and global security**

**Erin Webb, Ph.D., P.E.**  
**[webbeg@ornl.gov](mailto:webbeg@ornl.gov)**