

**ANTHONY F. TURHOLLOW, JR.**

**ADDRESS:** Environmental Sciences Division, Oak Ridge National Laboratory  
P.O. Box 2008, Oak Ridge, TN 37831  
e-mail: [turhollowaf@ornl.gov](mailto:turhollowaf@ornl.gov)

**EDUCATION:** Ph.D. in Agricultural Economics, Iowa State University, Ames, Iowa,  
1982  
M.S. in Environmental Engineering, Utah State University, Logan,  
Utah, 1998  
B.S. in Mathematics, Loyola Marymount University, Los Angeles,  
California, 1977

**PRIMARY AREAS OF RESEARCH INTEREST:**

Costs of biomass production, biomass energy from agriculture and short rotation woody crops, CO<sub>2</sub> and other greenhouse gases, logistics, energy and natural resource use in agriculture

**EMPLOYMENT HISTORY**

Research Staff, October 1984 to August 1993, October 1998 to present, Oak Ridge National Laboratory.

June 2007-June 2008: on assignment to the Office of the Biomass Program, US Department of Energy, Washington, DC. Assist in development of Regional Biomass Feedstock Partnerships under the Sun Grant Initiative, long-term planning for energy crop development.

Selected research activities: 1) estimate costs of collecting corn residues and energy crops for use as energy, and investigate economics of logistics, handling, transport, and storage, 2) evaluate cost estimates for new pesticide products, 3) energy and greenhouse balances for corn to ethanol and energy crops. U.S. Department of Energy's Biofuels Feedstock Development Program as program manager and economic and research analyst, 1983-1993. Task manager for oilseed crops development, 1984-1990.

Biomass Consultant, 1993 to 1998. Estimate cost of harvesting sugar cane residues, cost of herbaceous energy crop harvest, cost of wood transport, CO<sub>2</sub> and other greenhouse gases from energy crops, costs and quantities of crop residues for energy, and impacts of increased oilseed production in the Southeast.

Detailer, May 1992 to September 1992, Office of Technology Assessment (OTA), Congress of the United States. Research on chapter on biomass for OTA report on renewable energy.

Research Associate, October 1982 to September 1984, Oak Ridge National Laboratory. Department of Energy's Biomass Energy Program in Herbaceous Crops, evaluation of the Headwater Benefits Energy Gain (HWBEG) Model and cost allocation methods, residential and commercial end-use modeling, Uranium Industry Viability Study, Petroleum Allocation (PAL) Model documentation, FEMA projects.

Resident Student Associate, June 1982 to September 1982, Argonne National Laboratory. Impact of large-scale energy crop production on U.S. agriculture.

Research Assistant, September 1978 to September 1982, Center for Agricultural and Rural Development, Iowa State University. Research under the direction of Dr. Earl O. Heady including investigations into agricultural water resources, energy prices and agriculture, and alcohol production from grains and crop residues.

## PUBLICATIONS

U.S. Department of Energy. 2011. *U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry*. R.D. Perlack and B.J. Stokes (Leads), ORNL/TM-2010/224. Oak Ridge National Laboratory, Oak Ridge, TN

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Wright, L. and A. Turhollow, "Switchgrass selection as a 'model' bioenergy crop: A history of the process," *Biomass and Bioenergy* 34(6):851-868, June 2010, doi:10.1016/j.boimbioe.2010.01.030.

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Sokhansanj, S., S. Mani, S. Tagore, and A.F. Turhollow, "Techno-economic analysis of using corn stover to supply heat and power to a corn ethanol plant – Part 1: Cost of feedstock supply logistics," *Biomass and Bioenergy* 34(1): 75-81, January 2010, doi:10.1016/j.boimbioe.2009.10.001.

Turhollow, Anthony, Erin Wilkerson, and Shahab Sokhansanj, *Cost methodology for biomass feedstocks: Herbaceous crops and agricultural residues*, ORNL/TM-2008/105, Oak Ridge National Laboratory, Oak Ridge, TN, 2009.

Hess, J. Richard, Kevin L. Kenney, Christopher T. Wright, Robert Perlack, and Anthony Turhollow, "Corn stover availability for biomass conversion: Situation analysis," *Cellulose* 16(4):599-619, August 2009 DOI 10.1007/s10570-009-9323-z.

Sokhansanj, Shahab, Sudhagar Mani, Anthony Turhollow, Amit Kumar, D. Bransby, Lee Lynd, and Mark Laser, "Large scale production, harvest and logistics of switchgrass (*Panicum virgatum*) – Current technology and visioning a mature technology," *Biofuels, Bioproducts & Biorefining*, 3(2):124-141, 2009.

Turhollow, Anthony, *Corn-to-Ethanol Energy Balance*, ORNL/TM-2009/089, Oak Ridge National Laboratory, Oak Ridge, TN, forthcoming.

Biomass Research and Development Board. *Increasing feedstock production for biofuels*. December 2008. Contributor to economics.

Sokhansanj, S., A.F. Turhollow, J. Stephen, M. Stumburg, J. Fenton, and S. Mani, "Analysis of five simulated straw harvest scenarios," *Canadian Biosystems Engineering Journal* 50 (2008):2.27-2.35.

Sokhansanj, S., A. Turhollow, and E.G. Wilkerson, *Integrated Biomass Supply and Logistics: A modeling environment for designing feedstock supply systems for biofuel production*. IN Resource Engineering and Technology for a Sustainable World, ASABE, St. Joseph, MI, 2008.

Sokhansanj, Shahab, Anthony Turhollow, and Erin Wilkerson, *Development of the Integrated Biomass Supply and Logistics Model (IBSAL)*, ORNL/TM-2006/57, Oak Ridge National Laboratory, Oak Ridge, TN, 2008.

Turhollow, A. F. and S. Sokhansanj, "Costs of harvesting, storing in a large pile, and transporting corn stover in a wet form," *Applied Engineering in Agriculture* 23(4):439-448, 2007.

Sokhansanj, S, A. F. Turhollow, and Sam Tagore, Logistics of high moisture stover storage and transport. ASABE paper 076153. Presented at the International Meeting of the ASABE, Minneapolis, MN July 17-20, 2007.

Sokhansanj, S., A. Kumar, and A. F. Turhollow, "Development and implementation of integrated biomass supply analysis and logistics (IBSAL) model," *Biomass and Bioenergy*, 30:838-847, 2006.

Mani, S., Sokhansanj, A. Bi, and A. F. Turhollow, "Economics of producing fuel pellets from biomass," *Applied Engineering in Agriculture* 22(3):421-426, 2006.

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Sokhansanj, S. and A. F. Turhollow, "Biomass densification-cubing operations and costs for corn stover," *Applied Engineering in Agriculture* 20(4):495-499, July 2004.

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Turhollow, A., "The Economics of Energy Crop Production," *Biomass and Bioenergy* 6(3):229-241, 1994.

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Wright, L. L., R. L. Graham, A. F. Turhollow, and B. C. English, "Opportunities to Mitigate Carbon Dioxide Buildup Using Short-Rotation Woody Crops," IN R. N. Sampson and D. Haire (eds.), *Forests and Global Warming*. Vol. 1, American Forestry Association, Washington, D.C., 123-156, 1992.

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Turhollow, A. F. and R. D. Perlack, "Emissions of CO<sub>2</sub> from Energy Crop Production," *Biomass and Bioenergy*, 1(3):129-135, 1991.

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Cushman, J. H., A. F. Turhollow, and J. W. Johnston, *Herbaceous Energy Crops Program: Annual Progress Report for FY 1986*, ORNL-6369, Oak Ridge National Laboratory, Oak Ridge, TN, May 1987.

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