

Bibliography

- ABARE.** 2009. *Energy in Australia in 2009*. Canberra, Australian Bureau of Agricultural and Resource Economics (also available at www.abare.gov.au/interactive/09).
- Abdallah, J.M. & Monela, G.G.** 2007. Overview of miombo woodlands in Tanzania (available at www.metla.fi/julkaisut/workingpapers/2007/mwp050-02.pdf).
- ADAS.** 2006. *Potential impacts of future energy policy on UK biodiversity*. SD0307. Report for Department of Environment, Food and Rural Affairs. London, ADAS.
- Bailis, R., Ezzati, M. & Kammen, D.** 2005. Mortality and greenhouse gas impacts of biomass and petroleum energy futures in Africa. *Science*, 308(5718): 98–103.
- Barnes, D.F., Openshaw, K. Smith, K. & van der Plas, R.** 1994. *What makes people cook with improved biomass stoves? A comparative international review of stove programs*. Technical Paper Number 242. Energy Series. Washington, DC, World Bank.
- Bhattacharya, S.** 2009. Burn epidemiology: an Indian perspective. *Indian Journal of Plastic Surgery*, 42(2): 193–194.
- Bhattacharya, S. C. & Jana, C.** 2009. Renewable energy in India: Historical developments and prospects. *Energy Policy*, 34(8): 981–991.
- Bhattacharya, S. C. & Salam, P. A.** 2002. Low greenhouse gas biomass options for cooking in the developing countries. *Biomass and Bioenergy*, 22(4): 305–317.
- Biran, A., Abbot, J. & Mace, R.** 2004. Families and firewood: a comparative analysis of the costs and benefits of children in firewood collection and use in two rural communities in sub-Saharan Africa. *Human Ecology*, 32: 1–25.
- Bond, T.C., Streets, D. G. Yarber, K.F., Nelson, S.M., Woo, J.-H. & Klimont, Z.** 2004. A technology-based global inventory of black and organic carbon emissions from combustion. *Journal of Geophysical Research*, 109.
- Bond, T. C. & Sun, H.** 2005. Can reducing black carbon emissions counteract global warming? *Environmental Science and Technology*, 39(16): 5921–5926.
- Bradley, D.** 2009. Canada report on bioenergy 2009. *Climate Change Solutions*, 7 July.
- Bruce N.G., Perez-Padilla R. & Albalak, R.** 2002. *The health effects of indoor air pollution exposure in developing countries*. Geneva, Switzerland, World Health Organization.
- Cao, J.J., Lee, S.C., Chow, J.C., Watson, J.G., Ho, K.F., Zhang, R.J., Jin, Z.D., Shen, Z.X., Chen, G.C., Kang, Y.M., Zou, S.C., Zhang, L.Z., Qi, S.H., Dai, M.H., Cheng, Y., Hu, K.** 2007. Spatial and seasonal distributions of carbonaceous aerosols over China. *Journal of Geophysical Research*, 112, D22S11. doi:10.1029/2006JD008205.
- Carle, J. & Holmgren, P.** 2008. Wood from planted forests: a global outlook 2005–2030. *Forest Products Journal*, 58(12): 6–18.
- CCBA.** 2005. *The Climate, Community and Biodiversity Alliance project design standards*. Washington, DC, Climate Community and Biodiversity Alliance.

- Chadwick, B. P.** 2006. Transaction costs and the Clean Development Mechanism. *Natural Resources Forum*, 30: 256–271.
- DEFRA.** 2002. *Growing short rotation coppice – best practice guidelines for applicants to DEFRA'S energy crops scheme*. London, Department of Environment, Food and Rural Affairs.
- ECCM.** 2006. *Environmental standards for biofuels*. London, Edinburgh Centre for Carbon Management (also available at [www.lowcvp.org.uk/assets/reports/Final percent20LCVP percent20Environmental percent20Standards percent20Report.doc](http://www.lowcvp.org.uk/assets/reports/Final%20LCVP%20Environmental%20Standards%20Report.doc)).
- EcoSecurities.** 2008. Nobrecel biomass to energy project. VER monitoring report. Monitoring periods 01/01/2002–31/12/2007 and 01/01/2008 – 31/10/2008.
- EPE.** 2009. *Balanço energético nacional 2009: ano base 2008 resultados preliminares*. Rio de Janeiro, Brazil, Empresa de Pesquisa Energética.
- ESMAP.** 2010. *Sustainable production of commercial wood fuel: lessons and guidance from two strategies*. World Bank Energy Sector Management Assistance Program. Washington, DC, World Bank.
- European Commission.** 2006. *Biomass action plan*. Brussels, European Commission.
- European Commission.** 2009. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
- European Pellet Centre.** 2009. Final report on producers, traders and consumers of wood pellets (available at www.pelletsatlas.info).
- European Pellet Centre.** 2010. European Pellet Centre (available at www.pelletcentre.info).
- Ezzati, M. & Kammen, D.M.** 2001. Indoor air pollution from biomass combustion and acute respiratory infections in Kenya: an exposure-response study. *Lancet* (British edition), 358(9282): 619–624.
- Ezzati, M. & Kammen, D.M.** 2002. Evaluating the health benefits of transitions in household energy technologies in Kenya. *Energy Policy*, 30(10): 815–826.
- Faaij, A.P.C.** 2006. Bioenergy in EU: changing technology choice, *Energy Policy*, 34: 322–342.
- FAO.** 2004. *Unified Bioenergy Terminology*. Rome.
- FAO.** 2005. *Global forest resources assessment 2005: South Africa country report*. Rome (available at <ftp://ftp.fao.org/docrep/fao/010/ai961E/ai961E00.pdf>).
- FAO.** 2006a. *Global Forest Resources Assessment 2005 – progress towards sustainable forest management*. FAO Forestry Paper 147. Rome (also available at <ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf>).
- FAO.** 2006b. *Global planted forests thematic study: results and analysis*. Planted Forests and Trees Working Paper FP38E. Rome (available at www.fao.org/docrep/012/j9429e/j9429e00.pdf).
- FAO.** 2008. *Responsible management of planted forests: voluntary guidelines*. Working Paper FP/37/E. FAO, Rome (available at www.fao.org/docrep/009/j9256e/J9256E00.htm).
- FAO.** 2009. *Planted forests and second-generation biofuels*. Planted Forests and Trees Working Paper FP/42E. Rome.

- FAO. 2010a. FAOSTAT (available at <http://faostat.fao.org>).
- FAO. 2010b. Woodfuels and climate mitigation: case studies in Brazil, India and Mexico. Forests and Climate Change Working Paper 6. Rome.
- FAO. 2010c. *Global Forest Resources Assessment 2010: Key findings*. Rome. (available at www.fao.org/forestry/fra/fra2010).
- Fernandes, S.D., Trautmann, N.M., Streets, D.G., Roden, C.A. & Bond, T.C. 2007. Global biofuel use, 1850–2000. *Global Biogeochemical Cycles*, 21.
- Forest Stewardship Council. 1996. *FSC international standard. Principles and criteria for forest stewardship*. FSC-STD-01-001 (version 4-0). Bonn.
- Forest Stewardship Council. 2006a. *FSC accredited forest stewardship standards*. FSC Accreditation Business Unit. Bonn.
- Forest Stewardship Council. 2006b. *Regional guidelines and standards*. Bonn (also available at www.rainforest-alliance.org/programs/forestry/smartwood/certification/regional).
- Forest Stewardship Council. 2010. *Global FSC certificates: type and distribution*. February 2010. Bonn.
- Hansson, J. & Berndes, G. 2009. Future bioenergy trade in the EU: modelling trading options from a cost-effectiveness perspective. *Journal of Cleaner Production* 17: S27–S36.
- Hansson, J., Berndes, G., Johnsson, F. & Kjarstad, J. 2009. Co-firing biomass with coal for electricity generation – an assessment of the potential in EU27. *Energy Policy* 37: 1444–1455.
- Heinimö, J., Pakarinen, V., Ojanen, V. & Kässi, T. 2007. International bioenergy trade – scenario study on international biomass market in 2020. Report for the International Energy Agency. Lappeenranta, Finland, Lappeenranta University of Technology.
- Hillring, B. 2006. World trade in forest products and woodfuel. *Biomass and Bioenergy* 30(10): 815–825 (also available at www.iso.org/iso/en/ISOOnline.frontpage).
- IBGE. 2009. Instituto Brasileiro de Geografia e Estatística. Produção da extração vegetal e silvicultura 2008. Rio de Janeiro: IBGE, Coordenação de Agropecuária, v. 23. 47 p.
- IEA. 2002. *World energy outlook 2002*. Paris, International Energy Agency.
- IEA. 2006. Energy for cooking in developing countries. *World energy outlook 2006*. Paris, International Energy Agency.
- IEA. 2008. *Principles of nutrient management for sustainable forest bioenergy production*. Biomass Production for Energy from Sustainable Forestry Technology Progress Report, IEA Bioenergy Task 31, ExCo62 Doc 07.03b, October (also available at www.ieabioenergytask31.org).
- IEA. 2009a. *Bioenergy – a sustainable and reliable energy source: a review of status and prospects*. Paris, International Energy Agency.
- IEA. 2009b. *World energy outlook 2009*. Paris, International Energy Agency.
- IEA. 2010a. Statistics and balances (available at www.iea.org/stats/index.asp).
- IEA. 2010b. *Opportunities and barriers for international bioenergy trade*. IEA Bioenergy Task 40 report, May 2010. Paris.

- IEA Bioenergy Task 40. 2009. *World maritime biofuel shipping study*. Paris, International Energy Agency.
- IGES. 2010. *IGES CDM review and rejected project database*. Hayama, Japan, Institute for Global Environmental Studies.
- IPCC, 2007. *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. B. Metz, O.R. Davidson, P.R. Bosch, R. Dave & L.A. Meyer. Cambridge, United Kingdom and New York, NY, USA, Cambridge University Press.
- ISO. 2006. ISO 14040: Environmental management – life cycle assessment – principles and framework (available at www.iso.org/iso/catalogue_detail?csnumber=37456).
- Johnson, F., Rosillo-Calle, F. 2007. Biomass, livelihoods and international trade: Challenges and Opportunities for the EU and Southern Africa. Stockholm Environment Institute.
- Johnson, T., Alatorre, C. Romo, Z. & Liu, F. 2009. *Low carbon development for Mexico*. Conference edition. Washington, World Bank.
- Junginger, M. 2006. *Overview of biomass – related sustainability certification efforts and policy in IEA Bioenergy*. IEA Bioenergy Task 40. Paris, International Energy Agency.
- Junginger, M., Sikkema, R. & Faaij, A. 2009. Analysis of the global pellet market including major driving forces and possible technical and non-technical barriers. EIE/06/020/SI2.448557. (available at www.pelletsatlas.info).
- Leach, G. & Johnson, F. 1999. *Modern bioenergy – a primer*. Stockholm, Stockholm Environment Institute.
- Leach, G. & Mearns, R. 1988. *Beyond the woodfuel crisis: people, land, and trees in Africa*. London, Earthscan.
- MacCarty, N., Ogle, D., Still, D., Bond, T. & Roden, C. 2008. A laboratory comparison of the global warming impact of five major types of biomass cooking stoves. *Energy for Sustainable Development* XII(2).
- Malimbwi, R.E., Zahabu, E. & Mchome, B. 2007. *Situation analysis of charcoal sector in Dar es Salaam, charcoal supply and consumption*. Morogoro, Tanzania, Sokoine University of Agriculture.
- McKinsey & Company. 2009. *Pathways to a low-carbon economy – Version 2 of the global greenhouse gas abatement cost curve*.
- McPeak, J. 2002. Fuelwood gathering and use in northern Kenya. Paper prepared for presentation to the meeting of the Association for Politics and Life Sciences, 11–14 August, Montreal, Quebec.
- Mead, D.J. 2005. Forests for energy and the role of planted trees. *Critical Reviews in Plant Sciences*, 24(5): 407–421.
- Michaelowa, A. & Jotzo, F. 2005. Transaction costs, institutional rigidities and the size of the Clean Development Mechanism. *Energy Policy*, 33: 511–523.
- Muhlbaier-Dasch, J. 1982. Particulate and gaseous emissions from wood-burning fireplaces. *Environmental Science and Technology*, 16: 639–645.
- NationMaster. 2010. UN statistics, as displayed graphically on: www.nationmaster.com.

- Pekska-Blanchard, M., Dolzan, P., Grassi, A., Heinimo, J., Junginger, M., Ranta, T. & Walter, A.** 2007. *Global wood pellets markets and industry: policy drivers, market status and raw material potential*. IEA Task 40 (available at www.bioenergytrade.org).
- Practical Action Consulting.** 2009. *Small-scale bioenergy initiatives: brief description and preliminary lessons on livelihood impacts from case studies in Asia, Latin America and Africa*. Prepared for PISCES and FAO by Practical Action Consulting, January 2009.
- PricewaterhouseCoopers.** 2006. *Development of environmental and social reporting guidance on the provenance of biofuels supplied through the renewable transport fuels obligation. A proposal for the low carbon vehicle partnership*. London, UK.
- Purohit, P.** 2009. Economic potential of biomass gasification projects under clean development mechanism in India. *Journal of Cleaner Production*, 17: 181–193.
- Rainforest Alliance.** 2007. *Rainforest Alliance/SmartWood generic standards for assessing forest management*. SmartWood Program FM-12. New York, United States, Rainforest Alliance. 24 pp. (also available at www.rainforest-alliance.org/forestry/documents/generic_standards.pdf).
- Raison, R.** 2002. Environmental sustainability of forest energy production. In J. Richardson, R. Björheden, P. Hakkila, A.T. Lowe & C.T. Smith, eds. *Bioenergy from sustainable forestry: guiding principles and practice*. Netherlands, Kluwer Academic Publishers.
- RCEP.** 2004. *Biomass as a renewable energy source*. London, Royal Commission on Environmental Pollution (available at www.rcep.org.uk/biomass/Biomasspercent20Report.pdf).
- Reddy, M.S. & Venkataraman, C.** 2002. Inventory of aerosol and sulphur dioxide emissions from India: I – Fossil fuel combustion. *Atmospheric Environment*, 36(4): 677–697.
- Rithwik Power Projects Limited.** 2008. VCS standard. VER monitoring report – Version I. Monitoring period 31/10/2006–24/03/2008.
- Roden, C. A., Bond, T. C., Conway, S., Benjamin, A. & Pinel, O.** 2006. Emission factors and real-time optical properties of particles emitted from traditional wood burning cookstoves. *Environmental Science and Technology*, 40: 6750–6757.
- Rodriguez, D.** 2006. The first Hewsaw to Argentina. *Hewsaw Team*, 1: 4.
- Sanchez, T.** 2010. *The hidden energy crisis: how policies are failing the world's poor*. Rugby, UK, Practical Action Publishing.
- Santana, R.C., Barros, N.F. & Comerford, N.B.** 2000. Above-ground biomass, nutrient content, and nutrient use efficiency of eucalypt plantations growing in different sites in Brazil. *New Zealand Journal of Forestry Science*, 30: 225–236.
- Schubert, R., Schellnhuber, H.J., Buchmann, N., Epiney, A., Griesshammer, R., Kulesa, M., Messner, D., Rahmstorf, S. & Schmid, J.** 2009. *Future bioenergy and sustainable land use*. German Advisory Council on Global change (WBGU). London, Earthscan.
- Scottish Natural Heritage.** 2007. *Biomass energy and the natural heritage*. Consultation Information. Inverness, UK, Scottish Natural Heritage.

- Sinton, J. E., Smith, K., Peabody, J., Yaping, L., Xiliang, Z., Edwards, R., Quan, G. 2004. An Assessment of Programmes to Promote Improved Household Stoves in China, *Energy for Sustainable Development*, 8(3):33–52.
- Smeets, E. & Faaij, A. 2007. Bioenergy potentials from forestry in 2050: an assessment of the drivers that determine the potentials. *Climatic Change*, 81: 353–390.
- Smith, K.R., Samet, J.M., Romieu, I. & Bruce, N. 2000a. Indoor air pollution in developing countries and acute lower respiratory infections in children. *Thorax*, 55: 518–532.
- Smith, K.R., Uma, R., Kishore, V.V.N., Zhang, J., Joshi, V. & Khalil, M.A.K. 2000b. Greenhouse implications of household stoves: an analysis for India. *Annual Review of Energy and the Environment*, 25: 741–763.
- Social Carbon. 2008. Guaraí, Itabira and Santa Izabel Ceramics fuel switching project. Monitoring report, version 03. Monitoring period 01/04/2006–30/09/2008.
- Social Carbon. 2009. Arrozal, GGP and Sul América Ceramics fuel switching project. Monitoring report, version 06. Monitoring period 2009 01/04/2006–31/03/2009.
- Stern, N. 2007. Stern Review on the Economics of Climate Change: Part III: The Economics of Stabilisation. HM Treasury, London: hm-treasury.gov.uk/sternreview_index.htm
- Streets, D., Gupta, S., Waldhoff, S., Wang, M., Bond, T. & Yiyun, B. 2001. Black carbon emissions in China. *Atmospheric Environment*, 35: 4281–4296.
- Tanzania Ports Authority. 2007. Tanzania Ports Authority website (available at www.tanzaniaports.com/dsm/index.htm).
- TATEDO. 2005. Potential for small-scale biomass power plant in Tanzania. Tanzania Traditional Energy Development and Environment Organisation, Dar es Salaam.
- UNCHS. 1993. *Application of biomass-energy technologies*. Nairobi, United Nations Centre for Human Settlements (Habitat).
- UNFCCC. 2010. Flexible mechanisms (Clean Development Mechanism, emissions trading, joint implementation) (available at www.unfccc.int/cdm.unfccc.int/index.html).
- UNDP. Undated. United Nations Development Programme Global Environment Facility project document: biomass energy for heating and hot water supply in Belarus (available at un.by/pdf/Belarus%20CC%20Biomass%20ProDoc.pdf).
- VCS. 2008. Voluntary carbon standard 2007 (available at www.v-c-s.org).
- VCS. 2010. VCS program normative document: project registration and VCU issuance process, v1.2. (available at <http://www.v-c-s.org/>).
- Venkataraman, C., Habib, G., Eiguren-Fernandez, A., Miguel, A.H. & Friedlander, S.K. 2005. Residential biofuels in South Asia: carbonaceous aerosol emissions and climate impacts. *Science*, 307(5714): 1454–1456.
- Walter, A., Dolzan, P. & Piacente, E. 2006. Biomass energy and bio-energy trade: historic developments in Brazil and current opportunities. Country report: Brazil – Task 40 – sustainable bioenergy trade; securing supply and demand. Final version (available at www.bioenergytrade.org/downloads/brazilcountryreport.pdf).
- Wender, I. 1986. Synthesis gas as a source of fuels and chemicals: C-1 chemistry *Annual Review of Energy*, 11: 295–314.

- Wiskerke, W.** 2008. *Towards a sustainable biomass energy supply for rural households in semi-arid Shinyanga, Tanzania: a cost/benefit analysis*. Utrecht, the Netherlands, Department of Science, Technology and Society, Utrecht University.
- Wiskerke, W.T., Dornburg, V., Rubanza, C.D.K., Malimbwi, R.E. & Faaij, A.P.C.** 2010. Cost/benefit analysis of biomass energy supply options for rural smallholders in the semi-arid eastern part of Shinyanga Region in Tanzania. *Renewable and Sustainable Energy Reviews*, 14: 148–165.
- Woods, J., Tipper, R., Brown, G., Diaz-Chavez, R., Lovell, J. & de Groot, P.** 2006. *Evaluating the sustainability of co-firing in the UK*. Report for the UK Department of Trade and Investment.
- World Resources Institute.** 2008. EarthTrends database (available at www.wri.org).
- WorldWatch Institute.** 2007. *Biofuels for transport: global potential and implications for sustainable energy and agriculture*. London, Earthscan.
- World Wide Fund for Nature.** 2006. WWF and the EU Biofuels Communication. Belgium: World Wide Fund for Nature Agriculture European Policy Office.

What woodfuels can do to mitigate climate change

Climate change can be mitigated in several ways, but most strategies emphasize reducing greenhouse gas emissions by reducing energy use and switching to energy sources that are less carbon intensive than fossil fuels. This publication explores the scope, potential and implications for using woodfuels to replace fossil fuels and thereby contribute to climate change mitigation. It analyses the current woodfuel offset mechanisms in place and their relative emission reduction potentials. The scope is limited to solid woodfuels (fuelwood, charcoal, prepared biomass such as woodchips and pellets, and recovered products or residues from wood processing industries). However, some themes covered will be applicable to all woodfuels, notably the socio-economic and environmental impacts, financing options and overall development implications of more intensive and efficient use of woodfuels. The publication will be of interest to specialists and policy-makers in forestry, climate change and renewable energy, as well as to forest managers, students and general audiences interested in learning more about the role of forests in energy production and the resulting mitigation potential.

ISBN 978-92-5-106653-9 ISSN 0258-6150



9 7 8 9 2 5 1 0 6 6 5 3 9

11756E/1/09.10