

Bioenergy References

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A biofuel strategy for Ireland with an emphasis on production of biomethane and minimization of land-take. A. Singh et al. *Renewable and Sustainable Energy Reviews*; Vol. 14 (1), Jan 2010, p.277-288

Increasing energy consumption has exerted great pressure on natural resources; this has led to a move towards sustainable energy resources to improve security of supply and to reduce greenhouse gas emissions. However, the rush to the cure may have been made in haste. Biofuels in particular, have a bad press both in terms of competition with good agricultural land for food, and also in terms of the associated energy balance with the whole life cycle analysis of the biofuel system. The emphasis is now very much on sustainable biofuel production; biofuels from wastes and lignocellulosic material are now seen as good sustainable biofuels that affect significantly better greenhouse gas balances as compared with first generation biofuels. Ireland has a significant resource of organic waste that could be a potential source of energy through anaerobic digestion. Ireland has 8% of the cattle population of the EU with less than 1% of the human population; as a result 91% of agricultural land in Ireland is under grass. Residues such as slurries and slaughter waste together with energy crops such as grass have an excellent potential to produce biogas that may be upgraded to biomethane. This biomethane may be used as a natural gas substitute; bio-compressed natural gas may then be an avenue for a biofuel strategy. It is estimated that a maximum potential of 33% of natural gas may be substituted by 2020 with a practical obtainable level of 7.5% estimated. Together with biodiesel from residues the practical obtainable level of this strategy may effect greater than a 5% substitution by energy of transport. The residues considered in this strategy to produce biofuel (excluding grass) have the potential to save 93,000 ha of agricultural land (23% of Irish arable land) when compared to a rapeseed biodiesel strategy. (Ref: 2010-Bio1)

Biomass for transportation fuels: A cost-effective option for the German energy supply? D. Martinsen et al. *Energy Policy*; Vol. 38 (1), Jan 2010, p.128-140 (Ref: 2010-Bio2)

Biofuel development strategies. *Economic Review*; Jul/Aug 2009, Vol. 40 (7/8), p.15-18
In 2008 global production of biofuels attained 80 billion liters, with ethanol accounting for 80 percent. This article looks at biofuel development and production strategies worldwide. Many programs have been launched and investment is rising, although energy and feedstock (palm oil and animal fats) prices are having an impact. (Ref: 2010-Bio3)

Market penetration of ethanol. K. R. Szulczyk et al. *Renewable and Sustainable Energy Reviews*; Vol. 14 (1), Jan 2010, p.394-403 (Ref: 2010-Bio4)

Biomethane in the transport sector: An appraisal of the forgotten option. M. Ahman. *Energy Policy*; Vol. 38 (1), Jan 2010, p.208-217 (Ref: 2010-Bio5)

Microalgae for biodiesel production and other applications: A review. T. M. Mata et al. *Renewable and Sustainable Energy Reviews*; Vol. 14 (1), Jan 2010, p.217-232 (Ref: 2010-Bio6)

Biodiesel production through the use of different sources and characterization of oils and their esters as the substitute of diesel: A review. S. P. Singh; D. Singh. *Renewable and Sustainable Energy Reviews*; Vol. 14 (1) Jan 2010, p.200-216 (Ref: 2010-Bio7)

Analysis of biomass residues potential for electrical energy generation in Albania. S. Karaj et al. *Renewable and Sustainable Energy Reviews*; Vol. (1), Jan 2010, p.493-499 (Ref: 2010-Bio8)

Sustainability constraints on UK bioenergy development. P. Thornley et al. *Energy Policy*; Vol. 37 (12), Dec 2009, p.5623-5635 (Ref: 2010-Bio9)

An outlook for sustainable forest bioenergy production in the Lake States. Dennis R. Becker et al. *Energy Policy*; Vol. 37 (12), Dec 2009, p.5687-5693 (Ref: 2010-Bio10)

International experiences of ethanol as transport fuel: Policy implications for India. S. Pohit et al. *Energy Policy*; Vol. 37 (11), Nov 2009, p.4540-4548 (Ref: 2010-Bio11)

The future is bright. Johnson, B. et al. *PPI: Pulp & Paper International*; Oct 2009, Vol. 51 (10), p.19-22

An article about converted consolidated bioprocessing (CBP) technology in the production of cellulosic ethanol in the U.S. (Ref: 2010-Bio12)

Studies regarding the potential of biodiesel production in the north-east development region of Romania. Robu, T. et al. *Environmental Engineering & Management Journal (EEMJ)*; Sep/Oct 2009, Vol. 8 (5), p.1035-1038 (Ref: 2010-Bio13)

A fuzzy multiple-objective approach to the optimization of bioenergy system footprints. R. R. Tan et al. *Chemical Engineering Research and Design*; Vol. 87 (9), Sep 2009, p.1162-1170 (Ref: 2010-Bio14)

Growth spurt: Biofuels industry burning brighter. *Inwood*; Sep/Oct 2009 (88), p.30-34
New Zealand companies involved in innovative projects include Ernslaw One which produces bio oil and char from radiata pine harvest waste, PermaPine which has a dual fuel system for burning coal and wood waste, and RCR Energy with its wood residue-burning boilers. A process was developed by RCR and Energy for Industry (EFI) to make viable fuel by dewatering the sludge from a meat processing plant. (Ref: 2010-Bio15)

The biorefining opportunities in Wales: Understanding the scope for building a sustainable, biorenewable economy using plant biomass. Adam Charlton et al. *Chemical Engineering Research and Design*; Vol. 87 (9), Sep 2009, p.1147-1161 (Ref: 2010-Bio16)

Fast-growing wood for more biomass energy. Hilgers, C. *Sun & Wind Energy*; (9) 2009, p.226-228 (Ref: 2010-Bio17)

Growing biofuel crops sustainably. Comis, D.; Perry, A. *Agricultural Research*; Sep 2009, Vol. 57 (8), p.7-9 (Ref: 2010-Bio18)



Biofuels: Environmental friend or foe? Roddy, D. *Institution of Civil Engineers – Proceedings: Energy*; Aug 2009 Vol. 162 (3), p.121-130 (Ref: 2010-Bio19)

Greenhouse gas emissions savings from biofuel technologies. Mortimer, N. D. *Institution of Civil Engineers. Proceedings - Energy*; Aug 2009 Vol. 162 (3), p.113-119 (Ref: 2010-Bio20)

Plenty of biomass, little sustainability. Blume, J. *Sun & Wind Energy*; (7) 2009, p.150-153
Studies are being conducted in Europe on how to use biomass in a more sustainable manner. (Ref: 2010-Bio21)

No substitute for oil? How Brazil developed its ethanol industry. A. Hira; L. Guilherme de Oliveira. *Energy Policy*; Vol. 37 (6), Jun 2009, p.2450-2456 (Ref: 2010-Bio22)

Biofuels 3.0: Monitoring progress towards sustainable alternatives. Goodall, N. *Energy World*; May 2009 (371), p.10-12

A year on from the introduction of the Renewable Transport Fuels Obligation, the author shares some findings from the Renewable Fuel Agency's administration of the scheme. (Ref: 2010-Bio23)

Algae's powerful future. R. McIntyre. *Futurist*; Vol. 43 (2), Mar/Apr 2009, p.25-32 (Ref: 2010-Bio24)

Views on the international market for energy biomass in 2020: Results from a scenario study. J. Heinimö et al. *International Journal of Energy Sector Management*; 2008 Vol. 2 (4), p.547-569 (Ref: 2010-Bio25)

Global trends on the processing of bio-fuels. Balat, M. *International Journal of Green Energy*; 2008, Vol. 5 (3), p.212-238 (Ref: 2010-Bio26)

Lower emissions from biodiesel combustion. Dincer, K. *Energy Sources Part A: Recovery, Utilization & Environmental Effects*; Jun 2008, Vol. 30 (10), p.963-968 (Ref: 2010-Bio27)

Towards producing a truly green biodiesel. Chhetri, A. B.; Islam, M. R. *Energy Sources Part A: Recovery, Utilization & Environmental Effects*; May 2008, Vol. 30 (8), p.754-764 (Ref: 2010-Bio28)

Bio-fuels from agricultural residues. Demirbas, A. *Energy Sources Part A: Recovery, Utilization & Environmental Effects*; Jan 2008, Vol. 30 (2), p.101-109 (Ref: 2010-Bio29)

Hazardous emissions from combustion of biomass. Demirbas, A. *Energy Sources Part A: Recovery, Utilization & Environmental Effects*; Jan 2008, Vol. 30 (2), p.170-178 (Ref: 2010-Bio30)

Comparative study on energy sustainability of biofuel production chains. D. Cocco. *Proceedings of the Institution of Mechanical Engineers: Part A: Journal of Power and Energy*; Aug 2007 Vol. 221 (5), p.637-645 (Ref: 2010-Bio31)

Web Links

Bioenergy - a sustainable and reliable energy source: A review of status and prospects. This 2009 IEA Bioenergy report can be found online here: <http://www.ieabioenergy.com/LibItem.aspx?id=6479>

There are other useful IEA Bioenergy publications online here: <http://www.ieabioenergy.com/Library.aspx>

Environmental and economic analysis of the fully integrated biorefinery. E.D. Sendich; B.E. Dale. *GCB Bioenergy*; Vol. 1 (5), 2009, p.331-345. This open access article is free online here: <http://www3.interscience.wiley.com/cgi-bin/fulltext/123206200/PDFSTART>

Biomass: Carbon sink or carbon sinner? This 2009 Environment Agency (UK) report can be found online here: <http://www.environment-agency.gov.uk/news/106432.aspx>