



Energy Journal Roundup: September 2009

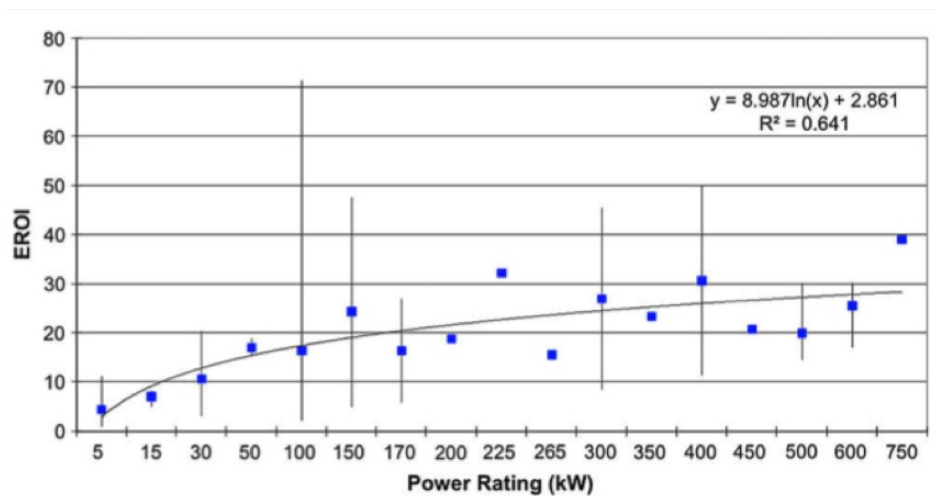
Posted by [David Murphy](#) on September 17, 2009 - 10:19am

Topic: [Miscellaneous](#)

Tags: [eroei](#), [wind eroei](#) [[list all tags](#)]

Feature Article

Ida Kubiszewski, Cutler J. Cleveland and Peter K. Endres, 2009, [Meta-analysis of net energy return for wind power systems](#), Renewable Energy, Volume 35, Issue 1, January 2010, Pages 218-225



EROI for operational wind turbines below 1 MW as a function of power rating in kilowatts.

*A side note: Over the past few months Rembrandt and I have been following roughly 10 or so academic journals related to energy. One of these journals, Renewable Energy, produces literature every month that I believe has particular relevance to the various issues discussed on The Oil Drum. This month's feature article is taken from Renewable Energy, and [here](#) is a link to the full table of contents with **free download** for this month's publication.*

The Energy Journal Roundup is a monthly post listing citations and abstracts from some of the peer-reviewed literature published in various energy journals around the world.

Ida Kubiszewski, Cutler J. Cleveland and Peter K. Endres, 2009, [Meta-analysis of net energy return for wind power systems](#), Renewable Energy, Volume 35, Issue 1, January 2010, Pages 218-225 **Download free [here](#).**

This analysis reviews and synthesizes the literature on the net energy return for electric

power generation by wind turbines. Energy return on investment (EROI) is the ratio of energy delivered to energy costs. We examine 119 wind turbines from 50 different analyses, ranging in publication date from 1977 to 2007. We extend on previous work by including additional and more recent analyses, distinguishing between important assumptions about system boundaries and methodological approaches, and viewing the EROI as function of power rating. Our survey shows an average EROI for all studies (operational and conceptual) of 25.2 (n = 114; std. dev = 22.3). The average EROI for just the operational studies is 19.8 (n = 60; std. dev = 13.7). This places wind in a favorable position relative to fossil fuels, nuclear, and solar power generation technologies in terms of EROI.

Eriksson, O., Finnveden, G., 2009, [Plastic Waste as a fuel – CO₂-neutral or not?](#), Energy & Environmental Science, Vol. 2, pp. 907-914

Municipal solid waste (MSW) is not only a societal problem addressed with environmental impact, it is also a resource that can be used for energy supply. In Northern Europe combustion of MSW (incineration with energy recovery) in combination with district heating systems is quite common. In Sweden, about 47% of the household waste is treated by incineration with energy recovery. Most incineration plants are CHP, summing up to 0.3% of the total electricity generation. MSW is to a high extent a renewable fuel, but plastic, rubber etc. can amount to 50% of the carbon content in the waste. Recycling of plastic is in general environmentally favourable in comparison to landfill disposal or incineration. However, some plastic types are not possible to recycle and some plastic is of such low quality that it is not suitable for recycling. This paper focuses on the non-renewable and non-recyclable plastic in MSW.

A CO₂ assessment has been made for non-recyclable plastic where incineration with energy recovery has been compared to landfill disposal. In the assessment, consideration has been taken of alternative fuel in the incinerator, emissions from waste treatment and avoided emissions from heat and power supply. For landfill disposal of plastic the emissions of CO₂ amounts to 253 g kg⁻¹ plastic. For incineration, depending on different discrete choices, the results vary from -673 g kg⁻¹ to 4605 g kg⁻¹. Results indicate that for typical Swedish and European conditions, incineration of plastics has net emissions of greenhouse gases. These emissions are also in general higher for incineration than for landfill disposal. However in situations where plastics are incinerated with high efficiency and high electricity to heat ratios, and the heat and the electricity from incineration of plastics are replacing heat and electricity in non-combined heat and power plants based on fossil fuels, incineration of plastics can give a net negative contribution of greenhouse gases. The results suggest that efforts should be made to increase recycling of plastics, direct incineration of plastics in places where it can be combusted with high efficiency and high electricity-to-heat ratios where it is replacing fossil fuels, and reconsider the present policies of avoiding landfill disposal of plastics.

Wang, L., Gwilliam, J., Jones, P., 2009, [Case Study of zero energy house design in UK](#), Energy and Buildings, Vol. 41, pp. 1215 – 1222

Possible solutions for zero energy building design in UK are discussed in this paper. Simulation software (EnergyPlus and TRNSYS 16) are employed in this study, where EnergyPlus simulations are applied to enable facade design studies considering building materials, window sizes and orientations and TRNSYS is used for the investigation of the feasibility of zero energy houses with renewable electricity, solar hot water system and energy efficient heating systems under Cardiff weather conditions. Various design methods are compared and optimal design strategies for typical homes and energy systems are provided

Faghih, A. K., Bahadori, M. N., 2009, [Solar radiation of domed roofs](#), Energy and Buildings, Vol. 41, pp. 1238 – 1245

Solar radiation received and absorbed by four domed roofs was estimated and compared with that of a flat roof. The domed roofs all had the same base areas, and equal to that of the flat roof. One of the roofs considered was the dome of the St. Peter's Church in Rome. Compared with the other roofs considered, this dome had a higher aspect ratio. It was found that all domed roofs received more solar radiation than the flat roof. Considering glazed tiles to cover a selected dome in Iran and the dome of the St. Peter's Church, it was found that the solar radiation absorbed by these roofs is reduced appreciably. In the case of the dome of St. Peter's Church, the amount of radiation absorbed was roughly equal to that absorbed by the comparable flat roof in the warm months. In the case of the glazed reference dome located in Yazd, Iran (a city with very high solar radiation), the radiation absorbed was less than that of flat roof at all times. In addition to aesthetics, this may be a reason for employing glazed tiles to cover the domes of all mosques, shrines, and other large buildings in Iran.

Jiří Jaromír Klemeš and Hon Loong Lam, 2009, [Heat integration, energy efficiency, saving and security](#), Energy, Volume 34, Issue 10, October 2009, Pages 1669-1673

This editorial and overview of a Special Issue dedicated to the 11th Conference Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction – PRES 2008. Thirteen papers have been selected and after being peer-reviewed. Nine were accepted for publication covering important subjects of energy generation and usage. They are focusing on recent development of various features of heat integration which is an important methodology for increasing energy efficiency and saving. The complementary issues covered are emissions reduction and the security of energy supply. This issue of ENERGY is the fourth special journal issue dedicated to selected papers from PRES conferences.

Joni Valkila, 2009, [Fair Trade organic coffee production in Nicaragua – Sustainable development or a poverty trap?](#), Ecological Economics, Volume 68, Issue 12, 15 October 2009, Pages 3018-3025

This article assesses the impact of Fair Trade organic coffee production on the well-being of small-scale farmers in Nicaragua. Studying the results of organic management is crucial for evaluating the advantages of Fair Trade because approximately half of all Fair Trade coffee is also organically certified. A wide range of farmers, representatives of cooperatives and export companies in Nicaragua were interviewed during seven months of field work between 2005 and 2008. Fair Trade organic production raises farmer income when low-intensity organic farming is an alternative to low-intensity conventional farming. However, low-intensity farming produces very little coffee in the case of the most marginalized farmers, keeping these farmers in poverty. With higher intensities of management, the economic advantages of Fair Trade organic production largely depend on prices in the mainstream market.

Perry Sadorsky, 2009, [Renewable energy consumption and income in emerging economies](#), Energy Policy, Volume 37, Issue 10, October 2009, Pages 4021-4028

Increased economic growth and demand for energy in emerging economies is creating an opportunity for these countries to increase their usage of renewable energy. This paper presents and estimates two empirical models of renewable energy consumption and income for a panel of emerging economies. Panel cointegration estimates show that increases in real per capita income have a positive and statistically significant impact on per capita renewable energy consumption. In the long term, a 1% increase in real income per capita increases the consumption of renewable energy per capita in emerging economies by approximately 3.5%. Long-term renewable energy per capita consumption price elasticity estimates are approximately equal to -0.70 .



This work is licensed under a [Creative Commons Attribution-Share Alike 3.0 United States License](#).