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Analysis of energy consumption and indicators of energy use in Bangladesh

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Economic Change and Restructuring

Joarder Mohammad Abdul Munim [1], Md. Mahbubul Hakim[1] & Md. Abdullah-Al-Mamun[1]

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Abstract

Rapid growth in the demand for commercial energy in Bangladesh poses serious development constraints in recent years. Per capita energy consumption of Bangladesh is one of the lowest in the world (252 kgoe in 2005). This paper undertakes an empirical investigation to find out the trends in energy intensities by comparing the energy consumption per capita and energy consumption per GDP for agriculture, industry, commercial, and transport sectors of Bangladesh and investigate their conditions over the long run. Only 43% of total population has access to electricity facility. Though natural gas provides two-third of the nation's commercial fossil fuel supply, only 4% households have access to natural gas networks. Biomass fuels are estimated to account for about 73% of the country's primary energy supply. The daily electricity output totals around 3800 MW against the demand of 6000 MW, leaving a supply crunch of 2200 MW. Natural gas has so far fuelled more than 90% of the power plants of the country. Hydro-electricity contributes only 3% of the total energy supply in Bangladesh. More than 90% of the oil and petroleum products are imported. The country has a

substantial potential for coal, most of which has yet to be explored. Overall energy intensity increased approximately twofold from 1980 to 2005. The findings of the study show that change in energy intensity is due to structural effect, while increase in aggregate energy consumption is due to both the activity effect and structural effect. Renewable energy sources will largely mitigate the dire energy crisis in rural areas of Bangladesh. Over 400,000 Solar Home Systems (SHSs) have been installed so far, benefiting over 4 million rural people. More fiscal and other incentives should be included in the recently formulated Renewable Energy Policy to investors for rapid development of clean energy. In addition, regional cooperation should be enhanced specially in case of hydro-power and natural gas. Finally, coal based power plant should be set up as early as possible.

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Notes

1. More formally, the elasticity of total natural gas demand with respect to its price is \(\varepsilon_{PG} = \left({\frac{PG}{Qgcon}} \right) \times \left({\frac{dQgcon}{dPG}} \right) \). The elasticity of total natural gas demand with respect to income can be expressed in the following terms: \(\varepsilon_{QY} = \left({\frac{Y}{Qgcon}} \right) \times \left({\frac{dQgcon}{dY}} \right) \) Where, Y_t = real per capita GDP in year t, PG_t = price (Taka/mcm) of natural gas in year t, and \(Q_{{gcon_{t} }} \) = natural gas consumption in year t.

2. Solar home systems consist of a PV panel that catches sun rays as directly as possible, converts solar energy to electricity and charges a storage battery (Balint 2006).

3. Clean Development Mechanism (CDM) is a flexible mechanism under the Kyoto Protocol. CDM gives industrialized nations the opportunity to finance greenhouse gas mitigation projects in developing nations with the aim of contributing to sustainable development while also helping industrialized nations meet their reduction commitments (UNFCCC 2002).

References

Ahmad QK (2001) Key messages arising from deliberations of Bangladesh Social and Economic Forum 2001 Dhaka 3–5 May, BASEF, BUP, Dhaka

Ahmad QK (2005) Energy security in Bangladesh: the regional cooperation perspective. In: Ahmad QK, Azim MA, Awal Mintoo A (eds) Energy security in Bangladesh, pp 83–100. Academic Press of Publishers Library, Dhaka, Bangladesh

Ahmed AU (2002) Energy and sustainable development in Bangladesh, in sustainable energy watch, Helio International 2002 Report. Website: www.heliointernational.org/Helio/Reports/2002/English/Bangledesh/BANSummary.html

Balint PJ (2006) Bringing solar home systems to rural El Salvador: lessons for small NGOs. Energy Policy 34:721–729

BBS (1975–2006) Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics (BBS), Dhaka

BER (2007) Bangladesh Economic Review 2007, Ministry of Finance and Economic Affairs, Government of Bangladesh, pp. 113–133

BGMEA (2007) The Bangladesh Garment Manufacturers and Exporters Association. http://www.bgmea.com.bd/

Dincer I, Dost S (1997) Energy and GDP. Int J Energy Res 21:153–167

EIA (2005) Energy information administration report: international energy annual 2005. Short Term Energy Outlook

EIA (2006E) Energy Information Administration database online http://www.eia.doe.gov/

Faruque MA, Hossain MA, Alam MN, Begum KZ (2002) Energy forecast report: Bangladesh, Workshop on Model South Asia Energy Forecast Report, Kathmundu, Nepal

Fenhann J (2006) CDM Project Pipeline, UNEP Riso Centre, Roskilde

Gas Utilization Report (2002) Committee report on utilization of natural gas in Bangladesh. Prepared the committee set up the Government of Bangladesh for the purpose

GOB (2006) Draft Coal Policy (Version 1), Infrastructure Investment Facilities Centre (IIFC), Ministry of Energy, Government of Bangladesh

Hossain I, Tanim M (2005) Energy and sustainable development in Bangladesh, HELIO International, Dhaka, Bangladesh

IDCOL (2005) IDCOL Renewable Energy Program, Infrastructure Development Company Limited, Dhaka

IDCOL (2007) IDCOL Renewable Energy Program, Infrastructure Development Company Limited, Dhaka

IEA/OECD (2004) Renewables Information 2004. International Energy Agency, Paris

IMF (2008) International Monetary Fund, World Economic Outlook Database

Islam AKMS, Islam M, Rahman T (2006) Effective renewable energy activities in Bangladesh. Renew Energy 31:677–688

Johnson SP (1993) The Earth Summit. The United Nations Conference on Environment and Development (UNCED), Graham and Torman Ltd and Martinus Nijhoff, Boston

Khan AR (2001) Bangladesh economy 2000: selected issues—a review. The Bangladesh Development Studies 27(2):95–114

Khan NH (2002) Current debate on gas and oil exploration in Bangladesh. Quarterly Bangladesh Foreign Policy Survey, BIISS, Dhaka

Khan AR, Hossain M (1989) The strategy of development in Bangladesh. Macmillian, UK, pp 31–66

Khan AMA, Imaduddin M (1999) Midterm Gas Demand-Supply Scenario and Gas Reserve of Bangladesh paper presented in the 2nd Petroleum Engineering Symposium 1999, organized by Petroleum and Mineral Resources Engineering Department, BUET, May 24–25, 1999

Lackner KS, Sachs JD (2005) A robust strategy for sustainable energy. Brook Pap Econ Activity 2:215–284

Mallick H (2009) Examining the linkage between energy consumption and economic growth in India. J Dev Areas 43(1):249–280

Metcalf GE (2008) An empirical analysis of energy intensity and its determinants at the state level. Energy J 29(3):1–26

Mozumder P, Achla M (2005) Causality relationship between electricity consumption and GDP in Bangladesh. Energy Policy 1–8

Nurul IM (2000) Some observations on Global Energy Scenerio and Critical Issues in Energy Development of Bangladesh Conference and Workshop paper, International Conference and Workshop on Critical Issues in Energy and Development Challenges for the OIC Countries, Organized by Islamic Institute of Technology, Gazipur, Dhaka, 20–23 November'2000

Nurul IM (2001) Energy Security and Sustainable Human Development: Bangladesh Perspective paper presented in Regional Conference on Human Security in South Asia, jointly organized by Institute of Peace and Conflict Studies (IPCS), New-Delhi, India and Bangladesh Institute of International Strategic Studies (BIISS), Dhaka, Bangladesh, 10–11 January'2001, New-Delhi

OGJ (2005) Oil Gas J. Website: www.ogj.com

OGJ (2006) Oil Gas J. Website: www.ogj.com

Pokharel SH (2006) An econometrics analysis of energy consumption in Nepal. Energy Policy 2006:1–12

Prothom alo (2009) Published on May 22, Page no. 3, Website: www.prothom-alo.com

Quader AKMA, Gomes E (2002) An Explanatory Review of Bangladesh Gas Sector: Latest Evidence and Areas of Further Research Paper presented at the CPD Dialogue on "Energy Sector of Bangladesh: What Are the Knowledge Gaps?" Centre for Policy Dialogue, Dhaka, January 24, 2002

REIN (2007) Renewable Energy Information Network (REIN), Bangladesh,

database. http://www.lged-rein.org/database.php?pageid=21

Samrina N (2004) Energy security for Bangladesh: prospects and strategic implications of natural gas. Program in Arms Control, Disarmament, and International Security (ACDIS) occasional paper. http://www.acdis.uiuc.edu/

Sarkar MAR, Ehsan M, Islam MA (2003) Issues relating to energy conservation and renewable energy in Bangladesh. Energy Sustain Dev II:77–87

Smith KR (1999) Fuel emission, health and global warming. Wood Energy News 14(3)

Subrata Kumar B (2003) Natural gas of Bangladesh: consumption pattern and its controversial issues. Mukherjee and Pramanik (eds), The Centre for Research in Indo-Bangladesh Relations, Kolkata

Suslick BS (1998) Factor analysis of trends in energy and metals production and consumption in developed and developing countries. Nonrenewable Resour 7(3):211–224

Tamim A (2009) Daily Prothom Alo, Published on 13th May, 2009, p 11. www.prothom-alo.com

The Daily Jugantor (2010) Published on 17th February, page no. 1. http://www.jugantor.com/

The Daily Star (2008) Published on 16th March, 2008, page no. 11. Website: www.thedailystar.net

Timilsina G, Lefevre T, Uddin SN (2001) New and renewable energy technologies

in Asia. Renew Energy World 52–67

Uddin SN, Taplin R (2006) A sustainable energy future in Bangladesh: current situation and need for effective strategies. The 2nd Joint International Conference on Sustainable Energy and Environment (SEE 2006) 21–23 November 2006, Bangkok, Thailand

Uddin SN, Taplin R, Xiaojiang Y (2006) Advancement of renewables in Bangladesh and Thailand: policy intervention and institutional settings. Nat Resour Forum 30:177–187

WB (1998) World Bank, World Development Report 1998/99: Knowledge for Development, published for World Bank, Oxford University Press

WDI (2008) World Development Indicator (WDI) online: http://data.worldbank.org/indicator

WEC (2000) World Energy Council. Website: www.worldenergy.org

Wilting HC, Biesiot W, Moll HC (1998) Trends in Dutch energy intensities for the period 1969–1988. Energy 23(10): 815–822

World Bank (2005) World development Indicators (WDI) online: http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,menuPK:232599~pagePK:64133170~piPK:64133498~theSitePK:239419,00.html

Zhang ZX (2003) Why did the energy intensity fall in China's Industrial Sector in the 1990s? The Relative Importance of Structural Change and Intensity Change. Energy Econ 625–638

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Author information

Authors and Affiliations

Department of Economics, Shahjalal University of Science & Technology, Sylhet, 3114, Bangladesh

Joarder Mohammad Abdul Munim, Md. Mahbubul Hakim & Md. Abdullah-Al-Mamun

Corresponding author

Correspondence to Joarder Mohammad Abdul Munim.

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