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# The impact of air transportation, railways transportation, and port container traffic on energy demand, customs duty, and economic growth: Evidence from a panel of low-, middle-, and high -income countries

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## Abstract

The transportation sector is highly sensitive due to the excessive use of energy, which though generates sufficient amount of income in terms of customs duty that supports country's per capita income; however, its effect largely the energy security issues across the globe. This study examines the impact of air transportation, railways transportation, and container port traffic on energy demand, customs duty, and economic growth in a panel of 40 heterogeneous countries, which comprises 16 low income & lower middle income (LI&LMI) countries and 24 upper middle & high income (UM&HI) countries for the period of 1990–2015. The study employed panel econometric techniques which account for cross-sectional dependence and heterogeneity. The results show that air-railways transportation has a positive and significant relationship with the energy demand (ED) in aggregated panel, whereas air-railways passengers carried positively influenced ED in LI&LMI countries, and railways transported goods (RT) significantly increases ED in UM&HI countries. Air freight (AF) and railways passengers carried (RPC) escalate customs duty (CUD) in aggregated panel, while RPC positively influences CUD in LI&LMI countries, and AF significantly increases CUD in UM&HI countries. Container port traffic (CPT) positively influenced per capita income (GDPPC) across countries. The causality estimates confirmed the bidirectional relationship, unidirectional, reverse causality, and no causal relationships between the studied variables with different transportation modes. The estimates of impulse response function (IRF) suggest that transportation (except RPC) and growth factors will positively influence ED in aggregated panel while differential impacts of transportation and growth factors will affect CUD over a next 30 years time period. The variance decomposition analysis (VDA) shows that GDPPC will largely influence by ED and least influenced by CUD, while CPT will greatly affect by CUD and least influenced by AF, over a next 30 years period. The overall results provoked the need of transportation energy infrastructure that desirable for long-term sustainable growth across countries. 

## Author keywords

Air transportation; Container port traffic; Customs duty; Energy demand; Panel cointegration techniques; Per capita income; Railways transportation

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## References (93)

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1 Acciaro, M., Ghiara, H., Cusano, M.I.

Energy management in seaports: A new role for port authorities

(2014) *Energy Policy*, 71, pp. 4-12. Cited 223 times.
http://www.journals.elsevier.com/energy-policy/
doi: 10.1016/j.enpol.2014.04.013

View at Publisher

2 Achour, H., Belloumi, M.

Investigating the causal relationship between transport infrastructure, transport energy consumption and economic growth in Tunisia

(2016) *Renewable and Sustainable Energy Reviews*, 56, pp. 988-998. Cited 127 times.
https://www.journals.elsevier.com/renewable-and-sustainable-energy-reviews
doi: 10.1016/j.rser.2015.12.023

View at Publisher

3 Achour, H., Belloumi, M.

Decomposing the influencing factors of energy consumption in Tunisian transportation sector using the LMDI method

(2016) *Transport Policy*, 52, pp. 64-71. Cited 128 times.
http://www.journals.elsevier.com/transport-policy/
doi: 10.1016/j.tranpol.2016.07.008

View at Publisher

4 Agrawal, R., Singh, N.R., Ribeiro, F.H., Delgass, W.N.

Sustainable fuel for the transportation sector

(2007) *Proceedings of the National Academy of Sciences of the United States of America*, 104 (12), pp. 4828-4833. Cited 194 times.
doi: 10.1073/pnas.0609921104

View at Publisher

5 Anable, J., Brand, C., Tran, M., Eyre, N.

Modelling transport energy demand: A socio-technical approach

(2012) *Energy Policy*, 41, pp. 125-138. Cited 158 times.
doi: 10.1016/j.enpol.2010.08.020

View at Publisher

6 Apergis, N., Tang, C.F.

Is the energy-led growth hypothesis valid? New evidence from a sample of 85 countries

(2013) *Energy Economics*, 38, pp. 24-31. Cited 127 times.
doi: 10.1016/j.eneco.2013.02.007

View at Publisher

7 Armstrong, R.C., Wolfram, C., De Jong, K.P., Gross, R., Lewis, N.S., Boardman, B., Ragauskas, A.J., (...), Ramana, M.V.

The frontiers of energy

(2016) *Nature Energy*, 1 (1), art. no. 15020. Cited 243 times.
www.nature.com/nenergy/
doi: 10.1038/nenergy.2015.20

View at Publisher

8 ATAG
Facts and Figures
(2016) . Cited 225 times.
Air Transport Action Group Geneva, Switzerland Online available at (Accessed 18 January 2017)
http://www.atag.org/facts-and-figures.html

9 Awokuse, T.O.
Is the export-led growth hypothesis valid for Canada?
(2003) *Canadian Journal of Economics*, 36 (1), pp. 126-136. Cited 100 times.
doi: 10.1111/1540-5982.00006
View at Publisher

10 Baltagi, B.H., Feng, Q., Kao, C.
A Lagrange Multiplier test for cross-sectional dependence in a fixed effects panel data model
(2012) *Journal of Econometrics*, 170 (1), pp. 164-177. Cited 454 times.
doi: 10.1016/j.jeconom.2012.04.004
View at Publisher

11 Becken, S.
Analysing international tourist flows to estimate energy use associated with air travel
(2002) *Journal of Sustainable Tourism*, 10 (2), pp. 114-131. Cited 176 times.
doi: 10.1080/09669580208667157
View at Publisher

12 Becken, S., Simmons, D.G., Frampton, C.
Energy use associated with different travel choices
(2003) *Tourism Management*, 24 (3), pp. 267-277. Cited 254 times.
www.elsevier.com/inca/publications/store/3/0/4/7/2/
doi: 10.1016/S0261-5177(02)00066-3
View at Publisher

13 Berndt, E.R., Botero, G.
Energy demand in the transportation sector of Mexico
(1985) *Journal of Development Economics*, 17 (3), pp. 219-238. Cited 26 times.
doi: 10.1016/0304-3878(85)90091-4
View at Publisher

14 Breusch, T., Pagan, A.
The Lagrange multiplier test and its application to model specification in econometrics
(1980) *Rev. Econ. Stud.*, 47, pp. 239-253. Cited 4042 times.

15 Cansino, J.M., Román, R.
Energy efficiency improvements in air traffic: The case of Airbus A320 in Spain

(2017) *Energy Policy*, 101, pp. 109-122. Cited 25 times.
http://www.journals.elsevier.com/energy-policy/
doi: 10.1016/j.enpol.2016.11.027

View at Publisher

16 CER
Rail Transport and Environment: Facts and Figures
(2015) . Cited 17 times.
Community of European Railway and Infrastructure Companies (CER) Paris
Online available at (Accessed 11 May 2017)
http://www.cer.be/sites/default/files/publication/Facts%20and%20figures%202014.pdf

17 Chai, J., Lu, Q.-Y., Wang, S.-Y., Lai, K.K.
Analysis of road transportation energy consumption demand in China

(2016) *Transportation Research Part D: Transport and Environment*, 48, pp. 112-124. Cited 76 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2016.08.009

View at Publisher

18 Chang, Y.-H., Chang, Y.-W.
Air cargo expansion and economic growth: Finding the empirical link (Open Access)

(2009) *Journal of Air Transport Management*, 15 (5), pp. 264-265. Cited 67 times.
doi: 10.1016/j.jairtraman.2008.09.016

View at Publisher

19 Chapman, L.
Transport and climate change: a review

(2007) *Journal of Transport Geography*, 15 (5), pp. 354-367. Cited 785 times.
doi: 10.1016/j.jtrangeo.2006.11.008

View at Publisher

20 Charles, M.B., Barnes, P., Ryan, N., Clayton, J.
Airport futures: Towards a critique of the aerotropolis model (Open Access)

(2007) *Futures*, 39 (9), pp. 1009-1028. Cited 78 times.
doi: 10.1016/j.futures.2007.03.017

View at Publisher

21 Chen, S.-M., He, L.-Y.

Welfare loss of China's air pollution: How to make personal vehicle transportation policy

(2014) *China Economic Review*, 31, pp. 106-118. Cited 78 times.
http://www.elsevier.com/locate/chieco
doi: 10.1016/j.chieco.2014.08.009

View at Publisher

22 Chen, W., Lei, Y.

Path analysis of factors in energy-related $CO_2$ emissions from Beijing's transportation sector

(2017) *Transportation Research Part D: Transport and Environment*, 50, pp. 473-487. Cited 40 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2016.11.027

View at Publisher

23 Christofakis, M., Tassopoulos, A., Moukas, B.

Port activity evolution: The initial impact of economic crisis on major Greek ports (Open Access)

(2013) *European Transport Research Review*, 5 (4), pp. 195-205. Cited 6 times.
doi: 10.1007/s12544-013-0100-6

View at Publisher

24 Deendarlianto, Widyaparaga, A., Sopha, B.M., Budiman, A., Muthohar, I., Setiawan, I.C., Lindasista, A., (...), Oka, K.

Scenarios analysis of energy mix for road transportation sector in Indonesia

(2017) *Renewable and Sustainable Energy Reviews*, 70, pp. 13-23. Cited 31 times.
https://www.journals.elsevier.com/renewable-and-sustainable-energy-reviews
doi: 10.1016/j.rser.2016.11.206

View at Publisher

25 Dumitrescu, E.-I., Hurlin, C.

Testing for Granger non-causality in heterogeneous panels

(2012) *Economic Modelling*, 29 (4), pp. 1450-1460. Cited 2853 times.
doi: 10.1016/j.econmod.2012.02.014

View at Publisher

26 EEA
Explaining road transport emissions - a non-technical guide
(2016) . Cited 70 times.
Online available at (Accessed 11 May 2017)
https://www.eea.europa.eu/publications/explaining-road-transport-emissions

27 EIA
Energy Use for Transportation
(2016) . Cited 3 times.
U.S Energy Information Administration Washington D.C Online available at (Accessed 17 December 2016)
http://www.eia.gov/energyexplained/?page=us_energy_transportation

28 EU
Road transport: reducing CO2 emissions from vehicles. European commission climate action program
(2017)
Online available at (Accessed 11 May 2017)
https://ec.europa.eu/clima/policies/transport/vehicles_en

29 Fernandes, E., Pacheco, R.R.
The causal relationship between GDP and domestic air passenger traffic in Brazil

(2010) *Transportation Planning and Technology*, 33 (7), pp. 569-581. Cited 81 times.
doi: 10.1080/03081060.2010.512217

View at Publisher

30 González, R., Hosoda, E.B.
Environmental impact of aircraft emissions and aviation fuel tax in Japan

(2016) *Journal of Air Transport Management*, 57, pp. 234-240. Cited 51 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2016.08.006

View at Publisher

31 Grahn, M., Azar, C., Williander, M.I., Anderson, J.E., Mueller, S.A., Wallington, T.J.
Fuel and vehicle technology choices for passenger vehicles in achieving stringent $CO_2$ targets: Connections between transportation and other energy sectors

(2009) *Environmental Science and Technology*, 43 (9), pp. 3365-3371. Cited 72 times.
http://pubs.acs.org/doi/pdfplus/10.1021/es802651r
doi: 10.1021/es802651r

View at Publisher

32 Grossmann, H., Otto, A., Stiller, S., Wedemeier, J.
Growth potential for maritime trade and Ports in Europe

(2007) *Intereconomics*, 42 (4), pp. 226-232. Cited 16 times.
https://sciendo.com/journal/IE
doi: 10.1007/s10272-007-0223-x

View at Publisher

33 Hakim, M.M., Merkert, R.

The causal relationship between air transport and economic growth: Empirical evidence from South Asia

(2016) *Journal of Transport Geography*, 56, pp. 120-127. Cited 115 times.
http://www.elsevier.com/inca/publications/store/3/0/4/4/8/index.htt
doi: 10.1016/j.jtrangeo.2016.09.006

View at Publisher

34 He, L.-Y., Chen, Y.

Thou shalt drive electric and hybrid vehicles: Scenario analysis on energy saving and emission mitigation for road transportation sector in China

(2013) *Transport Policy*, 25, pp. 30-40. Cited 92 times.
doi: 10.1016/j.tranpol.2012.11.006

View at Publisher

35 He, L.-Y., Yang, S., Chang, D.

Oil price uncertainty, transport fuel demand and public health

(2017) *International Journal of Environmental Research and Public Health*, 14 (3), art. no. 245. Cited 18 times.
http://www.mdpi.com/1660-4601/14/3/233/pdf
doi: 10.3390/ijerph14030245

View at Publisher

36 HE, L.-Y., QIU, L.-Y.

Transport demand, harmful emissions, environment and health co-benefits in China (Open Access)

(2016) *Energy Policy*, 97, pp. 267-275. Cited 67 times.
http://www.journals.elsevier.com/energy-policy/
doi: 10.1016/j.enpol.2016.07.037

View at Publisher

37 Higham, J., Cohen, S.A., Cavaliere, C.T., Reis, A., Finkler, W.

Climate change, tourist air travel and radical emissions reduction

(2016) *Journal of Cleaner Production*, Part B 111, pp. 336-347. Cited 125 times.
doi: 10.1016/j.jclepro.2014.10.100

View at Publisher

38 Hu, X., Chang, S., Li, J., Qin, Y.

Energy for sustainable road transportation in China: Challenges, initiatives and policy implications (Open Access)

(2010) *Energy*, 35 (11), pp. 4289-4301. Cited 124 times.
www.elsevier.com/inca/publications/store/4/8/3/
doi: 10.1016/j.energy.2009.05.024

View at Publisher

39 IEO
Chapter 1: World Energy Demand and Economic Outlook. U.S Energy Information Administration
(2016)
International Energy Outlook Washington D.C Online available at (Accessed 18 January 2017)
https://www.eia.gov/outlooks/ieo/pdf/world.pdf

40 IEO
Chapter 8: Transportation Sector Energy Consumption. U.S Energy Information Administration
(2016) . Cited 18 times.
International Energy Outlook Washington D.C Online available at (Accessed 17 December 2016)
https://www.eia.gov/outlooks/ieo/pdf/transportation.pdf

41 IIASA
Chapter 9: Energy End-use: Transport
(2014)
International Institute for Applied Systems Analysis Luxemburg, Austria Online available at (Accessed 18 January 2017)
http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/GEA_Chapter9_transport_lowres.pdf

42 Jacobson, M.Z., Delucchi, M.A.
Providing all global energy with wind, water, and solar power, Part I: Technologies, energy resources, quantities and areas of infrastructure, and materials

(2011) *Energy Policy*, 39 (3), pp. 1154-1169. Cited 1075 times.
doi: 10.1016/j.enpol.2010.11.040

View at Publisher

43 Ben Jebli, M., Belloumi, M.
Investigation of the causal relationships between combustible renewables and waste consumption and $CO_2$ emissions in the case of Tunisian maritime and rail transport (Open Access)

(2017) *Renewable and Sustainable Energy Reviews*, 71, pp. 820-829. Cited 51 times.
https://www.journals.elsevier.com/renewable-and-sustainable-energy-reviews
doi: 10.1016/j.rser.2016.12.108

View at Publisher

44 Johansson, B.
Will restrictions on $CO_2$ emissions require reductions in transport demand?

(2009) *Energy Policy*, 37 (8), pp. 3212-3220. Cited 33 times.
doi: 10.1016/j.enpol.2009.04.013

View at Publisher

45 Rehman Khan, S.A., Qianli, D., SongBo, W., Zaman, K., Zhang, Y.

Travel and tourism competitiveness index: The impact of air transportation, railways transportation, travel and transport services on international inbound and outbound tourism

(2017) *Journal of Air Transport Management*, 58, pp. 125-134. Cited 140 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2016.10.006

View at Publisher

46 Khan, S.A.R., Qianli, D., SongBo, W., Zaman, K., Zhang, Y.

Environmental logistics performance indicators affecting per capita income and sectoral growth: evidence from a panel of selected global ranked logistics countries

(2017) *Environmental Science and Pollution Research*, 24 (2), pp. 1518-1531. Cited 127 times.
http://www.springerlink.com/content/0944-1344
doi: 10.1007/s11356-016-7916-2

View at Publisher

47 Kim, J., Moon, I.

The role of hydrogen in the road transportation sector for a sustainable energy system: A case study of Korea (Open Access)

(2008) *International Journal of Hydrogen Energy*, 33 (24), pp. 7326-7337. Cited 73 times.
http://www.journals.elsevier.com/international-journal-of-hydrogen-energy/
doi: 10.1016/j.ijhydene.2008.09.050

View at Publisher

48 Lee, K.-C., Tsai, W.-H., Yang, C.-H., Lin, Y.-Z.

An MCDM approach for selecting green aviation fleet program management strategies under multi-resource limitations

(2018) *Journal of Air Transport Management*, 68, pp. 76-85. Cited 37 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2017.06.011

View at Publisher

49 Lenzen, M.

Total requirements of energy and greenhouse gases for Australian transport

(1999) *Transportation Research Part D: Transport and Environment*, 4 (4), pp. 265-290. Cited 105 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/S1361-9209(99)00009-7

View at Publisher

50 Liao, C.-H., Tseng, P.-H., Lu, C.-S.

Comparing carbon dioxide emissions of trucking and intermodal container transport in Taiwan (Open Access)

(2009) *Transportation Research Part D: Transport and Environment*, 14 (7), pp. 493-496. Cited 87 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2009.05.002

View at Publisher

51 Liao, C.-H., Tseng, P.-H., Cullinane, K., Lu, C.-S.

The impact of an emerging port on the carbon dioxide emissions of inland container transport: An empirical study of Taipei port

(2010) *Energy Policy*, 38 (9), pp. 5251-5257. Cited 91 times.
http://www.sciencedirect.com
doi: 10.1016/j.enpol.2010.05.018

View at Publisher

52 HE, L.-Y., QIU, L.-Y.

Transport demand, harmful emissions, environment and health co-benefits in China (Open Access)

(2016) *Energy Policy*, 97, pp. 267-275. Cited 67 times.
http://www.journals.elsevier.com/energy-policy/
doi: 10.1016/j.enpol.2016.07.037

View at Publisher

53 Lu, I.J., Lewis, C., Lin, S.J.

The forecast of motor vehicle, energy demand and $CO_2$ emission from Taiwan's road transportation sector

(2009) *Energy Policy*, 37 (8), pp. 2952-2961. Cited 85 times.
http://www.journals.elsevier.com/energy-policy/
doi: 10.1016/j.enpol.2009.03.039

View at Publisher

54 Lund, H., Kempton, W.

Integration of renewable energy into the transport and electricity sectors through V2G

(2008) *Energy Policy*, 36 (9), pp. 3578-3587. Cited 831 times.
doi: 10.1016/j.enpol.2008.06.007

View at Publisher

55 Meng, F., Liu, G., Yang, Z., Casazza, M., Cui, S., Ulgiati, S.

Energy efficiency of urban transportation system in Xiamen, China. An integrated approach

(2017) *Applied Energy*, Part 2 186, pp. 234-248. Cited 50 times.
https://www.journals.elsevier.com/applied-energy
doi: 10.1016/j.apenergy.2016.02.055

View at Publisher

56 Meng, X., Han, J.

Roads, economy, population density, and $CO_2$: A city-scaled causality analysis

(2018) *Resources, Conservation and Recycling*, 128, pp. 508-515. Cited 57 times.
www.elsevier.com/locate/resconrec
doi: 10.1016/j.resconrec.2016.09.032

View at Publisher

57 Niu, S.-Y., Liu, C.-L., Chang, C.-C., Ye, K.-D.

What are passenger perspectives regarding airlines' environmental protection? An empirical investigation in Taiwan (Open Access)

(2016) *Journal of Air Transport Management*, 55, pp. 84-91. Cited 25 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2016.04.012

View at Publisher

58 Notteboom, T.E., Rodrigue, J.-P.

Port regionalization: Towards a new phase in port development

(2005) *Maritime Policy and Management*, 32 (3), pp. 297-313. Cited 809 times.
doi: 10.1080/03088830500139885

View at Publisher

59 Notteboom, T.E., Vernimmen, B.

The effect of high fuel costs on liner service configuration in container shipping (Open Access)

(2009) *Journal of Transport Geography*, 17 (5), pp. 325-337. Cited 328 times.
doi: 10.1016/j.jtrangeo.2008.05.003

View at Publisher

60 Ong, H.C., Mahlia, T.M.I., Masjuki, H.H.

A review on energy pattern and policy for transportation sector in Malaysia

(2012) *Renewable and Sustainable Energy Reviews*, 16 (1), pp. 532-542. Cited 164 times.
doi: 10.1016/j.rser.2011.08.019

View at Publisher

61 Paramati, S.R., Shahbaz, M., Alam, M.S.

Does tourism degrade environmental quality? A comparative study of Eastern and Western European Union

(2017) *Transportation Research Part D: Transport and Environment*, 50, pp. 1-13. Cited 173 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2016.10.034

View at Publisher

62 Pedroni, P.
Fully modified OLS for heterogeneous cointegrated panels

(2000) *Advances in Econometrics*, 15, pp. 93-130. Cited 1545 times.
http://www.emeraldinsight.com/books.htm?issn=0731-9053
ISBN: 0762306882; 978-076230688-6
doi: 10.1016/S0731-9053(00)15004-2

View at Publisher

63 Pesaran, M.H.
General Diagnostic Tests for Cross Section Dependence in Panels
(2004) . Cited 4038 times.
University of Cambridge, Faculty of Economics Cambridge Working Papers in Economics No. 0435

64 Pesaran, M.H.
A simple panel unit root test in the presence of cross-section dependence

(2007) *Journal of Applied Econometrics*, 22 (2), pp. 265-312. Cited 5866 times.
doi: 10.1002/jae.951

View at Publisher

65 POLB
Port Emissions. Port of long beach -The green ports
(2016)
Online available at (Accessed 11 May 2017)
http://www.polb.com/environment/air/port_emissions.asp

66 Qiu, L.-Y., He, L.-Y.
Are chinese green transport policies effective a new perspective from direct pollution rebound effect, and empirical evidence from the road transport sector (Open Access)

(2017) *Sustainability (Switzerland)*, 9 (3), art. no. 429. Cited 15 times.
http://www.mdpi.com/2071-1050/9/3/429/pdf
doi: 10.3390/su9030429

View at Publisher

67 Qiu, L.-Y., He, L.-Y.
Can green traffic policies affect air quality? Evidence from a difference-in-difference estimation in China

(2017) *Sustainability (Switzerland)*, 9 (6), art. no. 1067. Cited 32 times.
http://www.mdpi.com/2071-1050/9/6/1067/pdf
doi: 10.3390/su9061067

View at Publisher

68 Ramanathan, R., Parikh, J.K.
Transport sector in India: An analysis in the context of sustainable development (Open Access)

(1999) *Transport Policy*, 6 (1), pp. 35-45. Cited 54 times.
doi: 10.1016/S0967-070X(98)00030-4

View at Publisher

69 Roso, V., Woxenius, J., Lumsden, K.

The dry port concept: connecting container seaports with the hinterland

(2009) *Journal of Transport Geography*, 17 (5), pp. 338-345. Cited 380 times.
doi: 10.1016/j.jtrangeo.2008.10.008

View at Publisher

70 Saidi, S., Hammami, S.
The factors of carbon dioxide emissions: what role of transport and energy consumption in sixty-five countries
(2016) *Bulletin of Energy*, 4 (3), pp. 200-210. Cited 4 times.

71 Saidur, R., Sattar, M.A., Masjuki, H.H., Ahmed, S., Hashim, U.

An estimation of the energy and exergy efficiencies for the energy resources consumption in the transportation sector in Malaysia

(2007) *Energy Policy*, 35 (8), pp. 4018-4026. Cited 100 times.
doi: 10.1016/j.enpol.2007.02.008

View at Publisher

72 Saleem, H., Jiandong, W., Zaman, K., Elsherbini Elashkar, E., Mohamd Shoukry, A.

The impact of air-railways transportation, energy demand, bilateral aid flows, and population density on environmental degradation: Evidence from a panel of next-11 countries
(Open Access)

(2018) *Transportation Research Part D: Transport and Environment*, 62, pp. 152-168. Cited 50 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2018.02.016

View at Publisher

73 Sánchez, R.J., Hoffmann, J., Micco, A., Pizzolitto, G.V., Sgut, M., Wilmsmeier, G.

Port efficiency and international trade: Port efficiency as a determinant of maritime transport costs

(2003) *Maritime Economics and Logistics*, 5 (2), pp. 199-218. Cited 183 times.
doi: 10.1057/palgrave.mel.9100073

View at Publisher

74 Schipper, L., Saenger, C., Sudardshan, A.

Transport and carbon emissions in the United States: The long view

(2011) *Energies*, 4 (4), pp. 563-581. Cited 50 times.
http://www.mdpi.com/1996-1073/4/4/563/pdf
doi: 10.3390/en4040563

View at Publisher

75 Schmidt, M., Paul, A., Cole, M., Ploetner, K.O.
Challenges for ground operations arising from aircraft concepts using alternative energy

(2016) *Journal of Air Transport Management*, 56 (Part B), pp. 107-117. Cited 24 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2016.04.023

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76 Shabbir, R., Ahmad, S.S.
Monitoring urban transport air pollution and energy demand in Rawalpindi and Islamabad using leap model (Open Access)

(2010) *Energy*, 35 (5), pp. 2323-2332. Cited 144 times.
www.elsevier.com/inca/publications/store/4/8/3/
doi: 10.1016/j.energy.2010.02.025

View at Publisher

77 Shiu, A., Li, R., Woo, C.-K.
Economic growth and infrastructure investments in energy and transportation: A causality interpretation of China's western development strategy

(2016) *Energy Journal*, 37, pp. 211-222. Cited 13 times.
http://www.iaee.org/en/publications/init2.aspx?id=0
doi: 10.5547/01956574.37.SI1.ashi

View at Publisher

78 Smith, P.M., Gaffney, M.J., Shi, W., Hoard, S., Armendariz, I.I., Mueller, D.W.
Drivers and barriers to the adoption and diffusion of Sustainable Jet Fuel (SJF) in the U.S. Pacific Northwest

(2017) *Journal of Air Transport Management*, 58, pp. 113-124. Cited 27 times.
www.elsevier.com/inca/publications/store/3/0/4/3/8/
doi: 10.1016/j.jairtraman.2016.10.004

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79 Sinha, A., Mehta, A.
Causal analysis of India's energy-led growth and CO2 emission (1960-2010)
(2014) *Indian J. Econ. Bus.*, 13 (1), pp. 81-89. Cited 16 times.

80 Taylan, O., Demirbas, A.
Forecasting and analysis of energy consumption for transportation in the Kingdom of Saudi Arabia (Open Access)

(2016) *Energy Sources, Part B: Economics, Planning and Policy*, 11 (12), pp. 1150-1157. Cited 8 times.
http://www.tandf.co.uk/journals/titles/15567249.asp
doi: 10.1080/15567249.2015.1004383

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