

- [24] Moksnes N, Welsch M, Gardumi F, Shivakumar A, Broad O, Howells M, et al. (2015). Working Paper Series 2015 OSeMOSYS User Manua.
- [25] Lenzen M, Kanemoto K, Moran D, Geschke A. (2012). Mapping the Structure of the World Economy. *Environ Sci Technol* 46: 8374–81. doi:10.1021/es300171x.
- [26] Lindner S, Legault J, Guan D. (2013). Disaggregating the electricity sector of china’s input–output table for improved environmental life-cycle assessment. *Econ Syst Res* 25: 300–20. <https://doi.org/10.1080/09535314.2012.746646>
- [27] Ozturk I. (2010). A literature survey on energy-growth nexus. *Energy Policy* 38: 340–9. <https://doi.org/10.1016/j.enpol.2009.09.024>
- [28] BMI Research (A Fitch Group Company). *Egypt Power Report Q2 2016*. London: 2016.
- [29] Davidsson S, Hagberg AK, Estimatin S, Davidsson AK, Hagberg, (2017). Estimating investment needs for the power sector in the african region, kth, 2014. <https://www.diva-portal.org/smash/get/diva2:770120/FULLTEXT01.pdf> (accessed June 11, 2017).g investment needs for the power sector. Kth, 2014.
- [30] BNI Research. (2016). *Report gas. oil & gas report Egypt oil & gas report Q4 2016*. London: 2016.

NOMENCLATURE

Symbol	Name, Unit
A	Technical coefficients matrix, MUSD
f	Final demand vector, MUSD
b	Exogenous transactions coefficients matrix, ton _{CO2} /MUSD
C _D	Downstream Cutoff matrix, TWh/MUSD
R	Exogenous transactions matrix, ton _{CO2}
x	Total production vector, MUSD
I	Identity matrix, -
GDP	Gross Domestic Product, MUSD
EE _{prod}	Electrical energy production, TWh
α, β	Econometric production function coefficients
ε	renewable effectiveness

Subscripts

n	Number of sectors in the country
0	Baseline year
N	National economy
E	Energy sector
i	i-th year