

Appendices

Appendix 1: Electricity consumption based on income groups

Expenditure quintile	Year	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18
0-20% (i.e. lowest expenditure): Extremely Poor	Electricity bill (LE)	18	18	18	18	19	20	31	33	48	59
	Yearly increase	0.0%	0.0%	0.0%	0.0%	3.9%	3.8%	56.8%	4.8%	46.6%	22.4%
	Monthly income	1141	1146	1150	1171	1191	1200	1214	1228	1241	1254
	% of income	1.6%	1.6%	1.6%	1.6%	1.6%	1.7%	2.6%	2.7%	3.9%	4.7%
20-40%: Poor	Electricity bill (LE)	21	21	21	21	22	22	34	40	61	77
	Yearly increase		0.0%	0.0%	0.0%	4.4%	4.2%	53.6%	17.4%	51.5%	25.0%
	Monthly income	1391	1404	1416	1435	1453	1467	1483	1499	1515	1531
	% of income	1.5%	1.5%	1.5%	1.4%	1.5%	1.5%	2.3%	2.7%	4.0%	5.0%
40-60%: Middle income	Electricity bill (LE)	21	21	21	21	22	23	36	42	63	79
	Yearly increase	0.0%	0.0%	0.0%	0.0%	4.6%	4.4%	52.5%	16.9%	52.2%	25.2%
	Monthly income	1,543	1,540	1,538	1,577	1,616	1,626	1,648	1,668	1,689	1,709
	% of income	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	2.2%	2.5%	3.7%	4.6%
60-80%: Upper-middle income	Electricity bill (LE)	24	24	24	24	25	26	39	45	70	88
	Yearly increase		0.0%	0.0%	0.0%	5.0%	4.8%	49.6%	15.3%	54.0%	25.7%
	Monthly income	1723	1728	1733	1785	1838	1857	1890	1921	1952	1983
	% of income	1.4%	1.4%	1.4%	1.3%	1.4%	1.4%	2.1%	2.4%	3.6%	4.4%

	e										
80-100%: High income	Electricity bill (LE)	39	39	39	39	41	44	62	68	109	139
	Yearly increase		0.0%	0.0%	0.0%	6.7%	6.3%	40.2%	9.7%	61.0%	27.6%
	Monthly income	2447	2563	2679	2647	2615	2689	2717	2753	2787	2821
	% of income	1.6%	1.5%	1.4%	1.5%	1.6%	1.6%	2.3%	2.5%	3.9%	4.9%
General mean	Electricity bill (LE)	25	25	25	25	26	27	40	46	70	88
	Yearly increase		0.0%	0.0%	0.0%	4.9%	4.7%	50.5%	12.8%	53.0%	25.2%
	Monthly income	1649	1676	1703	1723	1743	1768	1790	1814	1837	1860
	% of income	1.5%	1.5%	1.5%	1.4%	1.5%	1.5%	2.3%	2.5%	3.8%	4.7%

Note 1: Bills for each group were calculated using consumption data from Appendix 2 and consumption bracket prices according to official tariff increases.

Note 2: Quintile expenditure was calculated by taking the mean of every two consecutive deciles. Monthly expenditure was calculated by dividing annual expenditure by 12.

Sources:

Income: Years 2008, 2010 and 2012: CAPMAS 2013. Main Indicators of the Household Income, Expenditure and Consumption Survey 2012/2013. Table 17, p. 59.

The rest of the years: Projection by forecasting.

Electricity prices: prime ministerial decrees 1257/2014 and 2259/2015 and minister of electricity decrees 436/2016 and 312/2017.

Appendix 2: Electricity consumption by income quintiles

Spending quintiles	kWh/month
Least spending quintile: Lowest income	195
2nd Quintile: Low income	210
3rd Quintile: Middle income	215
4th Quintile: Upper-middle income	230
5th Quintile: High income	324
Source: CAPMAS. Household Income, Expenditure and Consumption Survey 2004/2005 Found in: World Bank 2005. Egypt — Towards a more effective social policy	

Appendix 3: Minimum electricity consumed

Estimated monthly consumption by a low-income household with basic appliances owned by more than 85% of the population*					
Appliance	Electricity consumption (W/h)**	Number of appliances	Hours of operation	Days of the month	Total (kWh/month)
Energy-efficient light bulb	8	4	6	30	5.8
Fridge (12 cu. ft.)	300	1	12	30	108.0
Washing machine	350	1	0.5	30	5.3
Television	200	1	6	30	36.0
Fan	60	1	4	30	7.2
Satellite dish/receiver	30	1	6	30	5.4
Blender/mincer	600	1	0.5	30	9.0
Cell phone (charging)	29	1	4	30	3.5
Total					180.1
Sources:					
*CAPMAS 2013. Household Income, Expenditure and Consumption Survey 2012/2013					
**Ministry of Electricity website - Services - Consumption calculator					
http://moe.gov.eg/test_new/calulate_energy.aspx					

Appendix 4: The percentages of household income spent on electricity in several countries

Country	Average Household Consumption (kWh/month)	% of Income	Bill (US dollars)	Income (US dollars)
Spain	363	7.1%	111	1567
Poland	175	6.8%	34	505
Japan	464	4.9%	112	2280
Egypt	269	4.7%		
Italy	228	3.8%	70	1824
Pakistan	178	3.8%		
Turkey	312	3.5%		
France	415	3.5%	80	2303
Indonesia	144	3.4%		
Denmark	332	3.3%	131	3909
Thailand	202	3.1%		
Germany	288	3.1%	112	3604
Vietnam	120	3.0%		

UK	346	2.8%	79	2871
Canada	897	2.6%	96	3661
South Africa	973	2.6%		
India	90	2.4%		
US	911	2.2%		
Australia	576	1.4%	62	4499

Sources:

What German households pay for power. Clean Energy Wire 16.02.2017

<https://www.cleanenergywire.org/factsheets/what-german-households-pay-power>

Energy Price Reform and Household Welfare: The Case of Turkey, Fan Zhang 2015

<https://www.iaee.org/energyjournal/article/2608>

Determinants of residential demand for electricity in South Africa, Jessika Bohlmann 2017

https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwj6rbiP8NzWAhVhM5oKHbOxCRcQFggqMAA&url=https%3A%2F%2F2017.essa.org.za%2Ffullpaper%2Ffessa_3519.pdf&usq=AOvVaw0vX3Cohd1e4j3qSZlcdQxE

Percentage of Household Income Spent on Electricity by State, Electric Choice 28.11.2016

<https://www.electricchoice.com/blog/percentage-income-electricity/>

Expenditure of Low-Income Households on Energy, World Bank 2010

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Mean disposable income by country, OECD.Stat 2014 <http://stats.oecd.org/Index.aspx?DatasetCode=IDD>

Income, receipts and expenditure of households in Germany, DESTATIS 2015

https://www.destatis.de/EN/FactsFigures/SocietyState/IncomeConsumptionLivingConditions/IncomeReceiptsExpenditure/Tables/IncomeExpenditure_D.html

Family spending in the UK: financial year ending March 2016, ONS

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/bulletins/familyspendingintheuk/financialyearendingmarch2016#lower-income-households-continued-to-have-less-money-to-spend-on-non-essential-items>

Appendix 5: Percentage change rate in the grid's peak load and nominal capacity between 2010/2011 and 2017/2018

	2011/ 2010	2012/ 2011	2013/ 2012	2014/ 2013	2015/ 2014	2016/ 2015	2017/ 2016	2018/ 2017	Mean
Nominal capacity (MW)	27,050	29,075	30,800	32,015	35,220	38,857	44,449	58,229	
Peak load (MW)	23,470	25,705	27,000	26,140	28,015	29,200	29,400	30,800	
Change rate in nominal capacity	–	7.5%	5.9%	3.9%	10%	10%	14%	31%	12%
Change rate in peak load	–	9.5%	5.0%	-3.2%	7.2%	4.2%	0.7%	4.8%	4.0%
Difference between peak load and	15.3%	13.1%	14.1%	22.5%	25.7%	33.1%	51.2%	89.1%	35.5%

nominal capacity									
Sources: Ministry of Electricity and Renewable Energy. The EEHC. The 2015/2016 and 2013/2014 Annual Reports. http://www.moe.gov.eg/test_new/report.aspx Egyptian Electric Utility and Consumer Protection Regulatory Agency. Electricity Observatory. August 2016 and August 2017 reports. http://egyptera.org/ar/elec_report.aspx (Electricity price in LE per kWh increases to 95.3 piasters, electricity ministry invests LE82.8 billion in projects), Ahram, 22.06.2017. http://www.ahram.org.eg/NewsQ/600327.aspx									