Power Sector Financial Vulnerability Assessment

Impact of the Credit Crisis on Investments in the Power Sector

Arab Republic of Egypt

Currency Equivalents

1 USD = 5.5 EGP

Fiscal Year

July 1 – June 30

Abbreviations and Acronyms

AfDB	African Development Bank
Arab Fund	Arab Fund for Social and Economic Development
BOOT	Build, own, operate and transfer
CCGT	Combined-cycle gas turbine
CTF	Climate Technology Fund
Danida	Danish Development Assistance
DFIs	Development financial institutions
EEHC	Egyptian Electricity Holding Company
EETC	Egyptian Electricity Transmission Company
EGP	Egyptian pound
EIB	European Investment Bank
FY	Fiscal year (ends on June 30th)
GW	Gigawatt (one billion watts)
GWh	Gigawatt-hour (one billion watt-hours)
IPP	Independent power producer
IsDB	Islamic Development Bank
JICA	Japan International Cooperation Agency
KfW	KfW Bankengruppe
Kuwait Fund	Kuwait Fund for Arab Economic Development
kWh	Kilowatt-hour (one thousand watt-hours)
LE	Egyptian pound
MENA	Middle East and North Africa
NIB	National Investment Bank of Egypt
NREA	New and Renewable Energy Agency
MW	Megawatt (one million watts)
OPEC Fund	OPEC Fund for International Development

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Executive Summary

- **The assessment has found that the global economic downturn and the credit and liquidity constraint situation have had limited immediate impact on the financing of the Egyptian power sector.** This is because all major ongoing sector investments are being carried out by the public sector, which obtained financing commitments prior to the crisis. **However, financing of new investment in the next five years will be a challenge.** This is due to public sector power companies' deteriorated financing position, high indebtedness, and the private sector financing environment that has grown more difficult.

- **Egypt's fiscal limitations over the next five years will be quite substantial.** It is likely a more prudent course for the government to consider reallocation of public capital expenditures. In the power sector, this entails reducing the overall public investment by reintroducing private investment.

- **Bold measures on the policy front will be required to help bring about a successful power sector investment program.** These include interrelated policies on, inter alia, creating a commercial framework for private investment in the power sector; electricity tariffs; and public utilities' capital structure and investment program.

- **The sector has benefited from both local and offshore debt financing.** The National Investment Bank of Egypt, a public sector investment vehicle, and development financial institutions are the primary sources of debt financing for the Egyptian public power entities. On the other hand, private commercial loans from both local and offshore sources are largely limited to private power entities. Debt capital market instruments remain of little use in the power sector.

- **The Government of Egypt is currently the largest equity investor in the power sector.** Private equity entered the sector through the three build-own-operate-transfer private power generation projects in the late 1990s and early 2000s. There has since been no further greenfield grid-connected private generation investment in the sector.

Introduction

1. The Structure of Egypt's Power Sector

- **The majority of Egypt's power industry is organized under the Egyptian Electricity Holding Company (EEHC)**, which includes six generation, one transmission-and-dispatch and nine distribution companies. EEHC also acts as the single buyer of electricity. Although formally unbundled, the sector continues to operate largely as vertically integrated, due to the single-buyer trading arrangements and consolidation of financial functions.

- There are three private build-own-operate-transfer independent power producers (BOOTs), which started operation in the early 2000s, under long-term power purchase agreements with EEHC. **Private generators accounted for about 10 percent of the electricity supply in Egypt in FY08.**

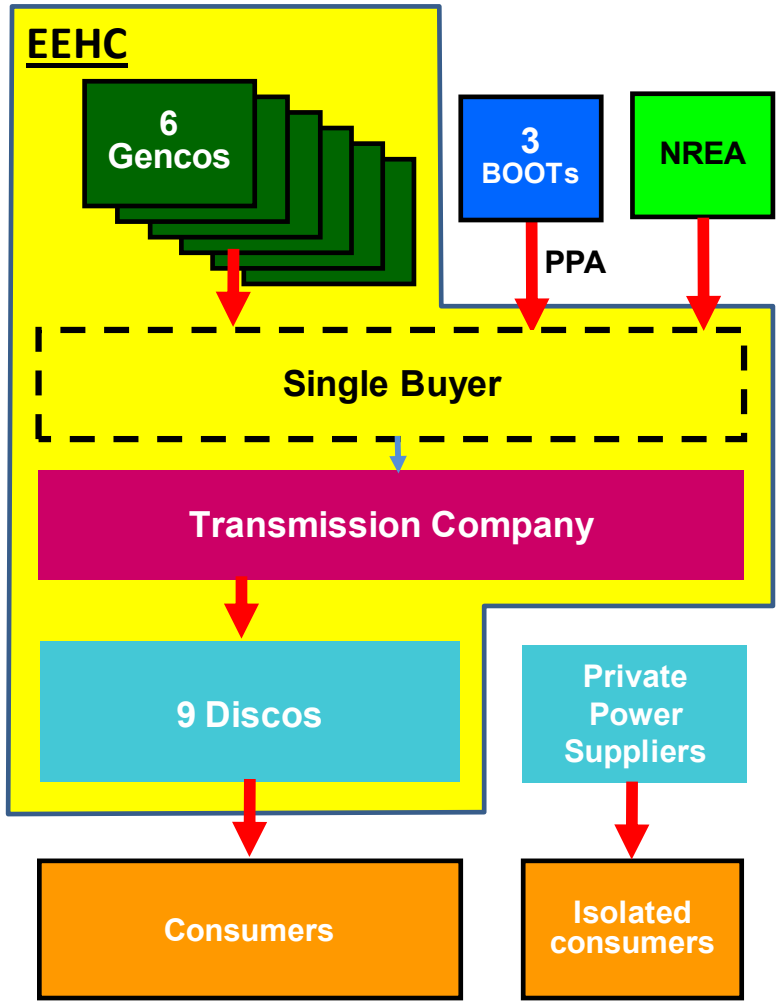
- The New and Renewable Energy Agency (NREA), an agency separate from EEHC, focuses on alternative energy, including wind and solar power generation.

- There are several very small private power suppliers serving isolated load pockets, mainly tourist areas.

- Egyptian electricity transmission networks are interconnected to Libya (220kV, started in May 1998), Jordan (400kV, Oct. 1998), and Syria through Jordan. (400kV, Mar. 2000).

- The sector is regulated by the Egyptian Electric Utility and Consumer Protection Agency (EERCPA).

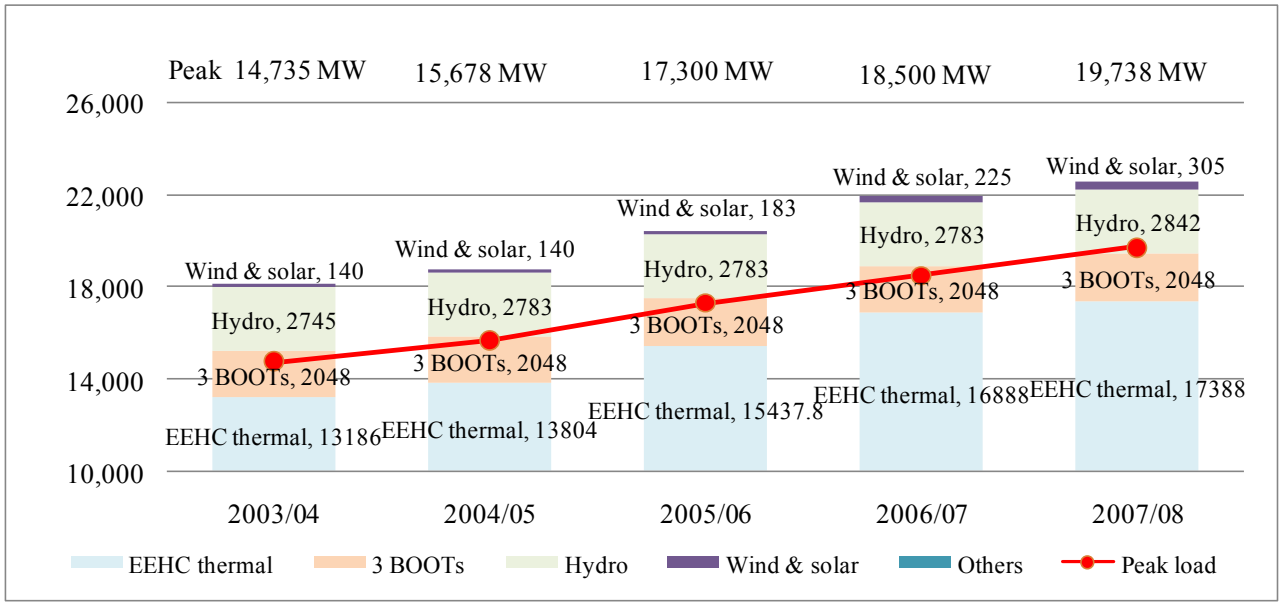
Figure 1: Egypt Power Sector Structure



2. Recent Electricity Demand and Supply

- **High electricity demand growth in recent years.** In FY08, peak electricity demand reached 19,738 MW and final sold electricity in Egypt totaled 107 TWh. During the past several years, electricity demand grew on average 7.5 percent per year, while real GDP grew by about 5.1 percent per year. (FY03-FY08)
- **Unmet peak load demand.** Load shedding has reportedly taken place recently during the peak load time of the day, mainly in residential urban/popular areas. While the nominal reserve margin (11.4 percent in FY08, excluding wind and solar) seems to be adequate, the reported load shedding hinted at potential system unavailability during peak load time. This could be an indication that actual available reserve margin is lower than nominal reserve margin due to derating of generating units.
- As of June 2008, the total installed capacity of Egypt was 22.6 GW, including (i) 20.2 GW of EEHC's power stations (17.4 GW thermal and 2.8 GW hydro), (ii) 2.1 GW of the 3 BOOTs (all gas-fired steam power plants) and (iii) 305 MW of NREA's wind farm. Electricity generated reached 125 TWh in FY08. Egypt is a net exporter of electricity, with about 560 GWh net exports to Jordan, Libya and Syria in FY08.

Figure 2: Installed Power Generation Capacity and Peak Load in Egypt (MW)



Source: EEHC

3. The economic downturn, credit crisis and Egypt's power sector

- **The prevailing economic downturn is expected to dampen electricity demand in Egypt in the next few years.** EEHC is forecasting a 6 percent annual growth in demand in the medium term, compared to an average of 7.5 percent growth over the last five years. In order to meet this expected demand, over 11,000 MW of additional generation capacity and associated infrastructure are being planned over the next seven years. This large *planned* capital investment program is partly a result of a backlog of investment following the economic crisis in the early 2000s. The following figure shows a larger increase in system peak load than that of installed generation capacity in the past seven years.

Figure 3: Egypt's Installed Power Generation Capacity* / Peak Electricity Demand (MW) / Final Electricity Demand (GWh)

	Installed MW		Peak MW		Final GWh sold (by EEHC)	
	MW	Annual Growth	MW	Annual Growth	GWh	Annual Growth
2000/01	15,223	4.5%	12,376	5.5%	64,807	6.6%
2001/02	16,590	9.0%	13,326	7.7%	69,431	7.1%
2002/03	17,608	6.1%	14,401	8.1%	74,947	7.9%
2003/04	17,979	2.1%	14,735	2.3%	80,655	7.6%
2004/05	18,635	3.6%	15,678	6.4%	85,781	6.4%
2005/06	20,269	8.8%	17,300	10.3%	92,829	8.2%
2006/07	21,719	7.2%	18,500	6.9%	98,812	6.4%
2007/08	22,278	2.6%	19,738	6.7%	107,226	8.5%

*Excluding wind farm, totaling 305 MW in 2007/08. Source: EEHC

- **Prior to the economic crisis in Egypt in the early 2000s, Egypt successfully introduced an independent power producer scheme – referred to as the BOOT** (Build-Own-Operate-Transfer) **--** whereby privately-owned power stations entered into long-term power purchase agreements with EEHC and benefited from state guarantees. Following a devaluation of the Egyptian pound in 2003, electricity tariffs payable to the BOOTs had increased in local currency terms since a substantial portion of the tariff is linked to the value of the US dollar. Taken together, the sudden tariff increase and the impact of the crisis stifled the momentum for private sector engagement in the Egyptian power sector. Following the crisis, the public sector again led investment in the sector, counting on specialized financial institutions, development financial institutions and multilateral development banks as primary financing sources. However, these financial institutions will eventually be restricted by their credit exposure limits, thus making it difficult for them to extend sizable new loans to the Egyptian power sector in the future.

- **The economic efficiency of public power sector investment has reached a turning point.** Both EEHC and NREA have become highly leveraged. Although the authorities have been pursuing recapitalization of EEHC and NREA, such a large investment program will place a substantial strain on the public sector's financial and human resources. As such, re-engagement of private sector investment in the sector has regained its momentum. However, power sector reform – particularly tariff reform – is not yet sufficiently advanced to attract private sector investment on a purely commercial basis. Despite electricity tariff increases in recent years[1], the average electricity selling tariff in Egypt was 18.7 piasters (3.4 US cents) per kWh in FY 2008/09, which is below the cost of generation for a commercially developed and operated thermal power station[2]. In addition, other major barriers such as contractual frameworks and risk allocation for private investors; system service obligations; and electricity trading arrangements have not been finalized. While sector reform is ongoing, some kind of interim private sector engagement framework is needed to make private investment financeable under tight credit market conditions.

This assessment begins with an overview of Egypt's power sector investment plan in the next seven years in Section 1. This overview is followed by a review in Section 2 of Egypt's fiscal space and an estimate of the incremental fiscal exposure that may arise from the power sector under the investment plan. The assessment then goes on to discuss the sources of debt and equity financing in the Egyptian power sector in Sections 3 and 4, respectively. The report concludes in Section 5 by focusing on the power generation investment plan that is scheduled to commence initial operations by FY 2014/15. This final section provides an overview of key financing challenges faced by the public sector entity and a roadmap toward a successful investment program, including private sector reengagement. The conclusion then endeavors to present a sequencing of upcoming public and private projects, based on the existing investment plan.

[1] The average selling tariff across all consumer groups rose from 13.1 piasters per kWh in FY 2003/04 to 18.7 piasters per kWh in FY 2008/09, or about 7 percent per annum.

[2] The latest commercially-developed thermal power station achieving financing commitment in 2009 is a 373 MW combined-cycle IPP in Jordan. The project has a levelized tariff of about five US cents per kWh, based on natural gas price of US$ 3.5 per million British thermal units.

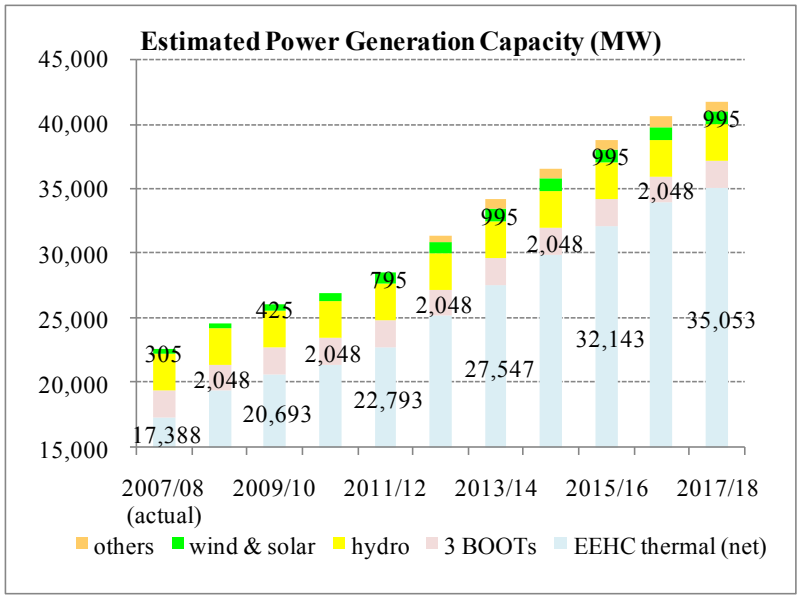
Section 1 – Power Sector Investment Plan

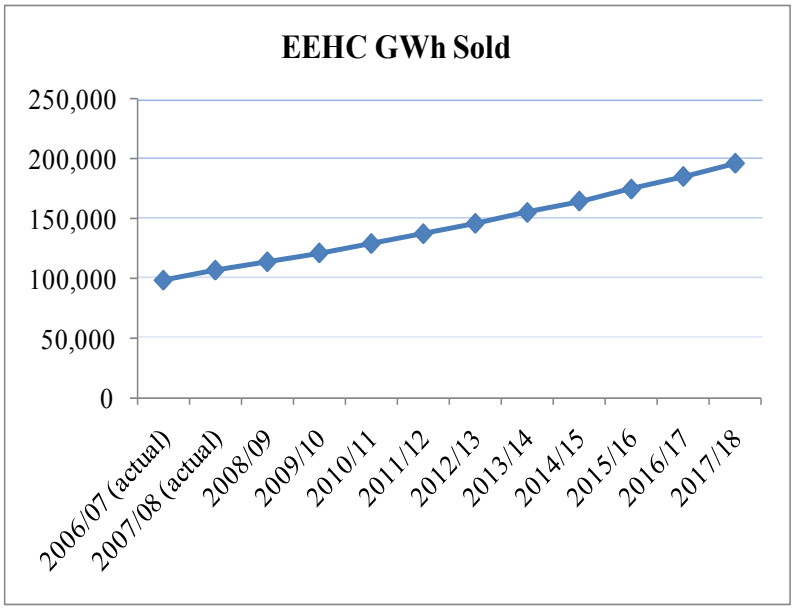
Electricity demand growth is estimated to decline from that of the past five years, which averaged 7.5 percent per annum. The current demand forecast expects a six percent demand growth per annum over the next seven years. EEHC is currently implementing new generation projects, which will add about 7,000 MW in the next few years. These projects have obtained financing commitments and are currently at various stages of construction.

This section describes an investment plan that goes beyond the current projects that are already underway, and which envisages over 11,000 MW as well as investments in transmission and distribution. The plan is estimated to cost on the order of EGP 117 billion (US$ 21.3 billion) over the next seven years. Financing for the planned investment will need to be identified. However, it is expected that some of the planned investment will eventually be provided by the private sector.

1. A recent power demand forecast estimates a lower demand growth of around six percent per year over the coming seven years.

Figure 4: Egypt's Electricity Demand Forecast & Estimated Power Generation Capacity





Source: EEHC

2. In order to meet the growing demand, EEHC is currently executing a number of generation projects that will add about 7,000 MW over the next five years. These projects obtained financing commitments prior to the current economic downturn, and are at various stages of construction.

3. The following table illustrates further planned investments in the power sector[3]. In aggregate, **planned investment for the next seven years exceeds EGP 117 billion (US$ 21 billion), comprising about EGP 95 billion (US$ 17 billion) for new generation capacity and about EGP 22 billion (US$ 4 billion) for transmission and distribution**. This includes new investment in about 11 GW of CCGT and steam power plants, 0.5 GW of wind and solar power stations, and the transmission and distribution network.

4. Of **the above total estimate, public investment is estimated at about EGP 109 billion (US$ 19.8 billion).** This amount is expected to be financed partially from EEHC's internal cash resources[4] and new debt financing. In the past three fiscal years, EEHC's net operating cash flow was on the order of EGP 3 – 6.7 billion per year (US$ 0.6 – 1.2 billion). Assuming EGP 6 billion (US$ 1.1 billion) per year of self-financing, **approximately EGP 67 billion (US$ 12.2 billion) of new debt financing will be required over the next seven years to fund public investment in the sector.**

5. Note that the above approximation of required public sector investment is *in addition to* projects currently under implementation, which are estimated to require an additional EGP 27 billion (US$ 4.9 billion) to complete. However, it is understood that financing commitments for these existing projects have been obtained.

6. **Private sector investment is estimated at about EGP 8.2 billion (US$ 1.5 billion).** Assuming a 75:25 debt-to-equity financing ratio, this translates to about EGP 6.2 billion (US$ 1.1 billion) of new debt financing and EGP 2 billion (US$ 0.4 billion) of private equity.

[3] Source: EEHC and World Bank staff estimates
[4] NREA internal cash resource is small and thus excluded from the assessment.

Figure 5: Estimated Power Sector Capital Investment in Egypt 2009/10 – 2017/18

Description	FY10 - FY16	Estimated investment value (LE thousand by disbursement)									
	(LE million)	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Generation - Public Investment											
EEHC											
Nuwaiba: 750MW CCGT	4,743	12,496	727,900	1,732,200	2,282,880	-	-	-	-	-	-
Giza North: 1500MW CCGT	7,422	-	17,620	946,980	1,575,900	4,881,100	-	-	-	-	-
Banha: 750MW CCGT	4,505	-	21,430	776,440	1,704,920	2,002,510	-	-	-	-	-
Qassasen: 1500MW CCGT	7,422	-	-	53,720	1,484,000	2,203,600	3,680,280	-	-	-	-
Suez: 650MW steam	6,811	-	26,930	1,206,620	1,906,380	2,098,010	1,572,860	-	-	-	-
Helwan South (i): 1300MW steam	12,209	-	-	705,860	2,527,700	2,955,600	2,923,200	2,085,820	1,010,420	-	-
Helwan South (ii): 1300MW steam	9,112	-	-	-	-	705,860	2,527,700	2,955,600	2,923,200	2,085,820	1,010,420
Qena: 1300MW steam	12,209	-	-	99,960	2,570,800	2,915,600	2,736,500	2,334,300	1,551,440	-	-
Damietta West: 1500MW CCGT	7,422	-	-	-	-	53,720	1,484,000	2,203,600	3,680,280	-	-
Safaga: 1300MW CCGT	8,452	-	-	-	-	361,000	2,458,400	2,915,600	2,716,500	2,255,000	1,502,100
NREA and others											
Wind 120MW - Danida	1,320		660,000	660,000							
Wind 120MW - JICA	1,320			660,000	660,000						
Wind 200MW - KfW	2,200						1,100,000	1,100,000			
CSP 100MW	2,200			1,100,000	1,100,000						
Total - new generation public investment	87,345	12,496	1,453,880	7,941,780	15,812,580	18,177,000	18,482,940	13,594,920	11,881,840	4,340,820	2,512,520
Generation - Private Investment											
IPP - 750MW CCGT	4,125			1,375,000	1,375,000	1,375,000					
Wind 120MW - captive	1,320			660,000	660,000						
Wind 250MW - BOO	2,750						1,375,000	1,375,000			
Total - generation private investment	8,195	-	-	2,035,000	2,035,000	1,375,000	1,375,000	1,375,000	-	-	-
Transmission & Distribution											
Transmission	12,900	1,725,000	2,300,000	2,000,000	1,800,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000
Distribution	8,901	949,944	1,052,943	1,171,990	1,271,991	1,350,955	1,350,955	1,350,955	1,350,955	1,350,955	1,350,955
Total - transmission & distribution	21,801	2,674,944	3,352,943	3,171,990	3,071,991	3,050,955	3,050,955	3,050,955	3,050,955	3,050,955	3,050,955
Grand Total, of which	117,341	**2,687,440**	**4,806,823**	**13,148,770**	**20,919,571**	**22,602,955**	**22,908,895**	**18,020,875**	**14,932,795**	**7,391,775**	**5,563,475**
Public investment	109,146	2,687,440	4,806,823	11,113,770	18,884,571	21,227,955	21,533,895	16,645,875	14,932,795	7,391,775	5,563,475
Private investment	8,195	-	-	2,035,000	2,035,000	1,375,000	1,375,000	1,375,000	-	-	-
Grand Total - US$ equivalent	*21,335*	*488,625*	*873,968*	*2,390,685*	*3,803,558*	*4,109,628*	*4,165,254*	*3,276,523*	*2,715,054*	*1,343,959*	*1,011,541*

Source: EEHC as of October 2009 ; World Bank staff estimates

Section 2 – Egypt's Fiscal Space

The Egyptian public sector has been largely responsible for investment in the domestic power sector. This assessment has found that Egypt's fiscal limitations over the next five years will be quite substantial, and that it is likely a more prudent course for the government to consider reallocation of public capital expenditures, including in the power sector.

1. **Fiscal reforms begun in 2005 were able to reduce the overall general government[5] budget deficit from 9.2 percent of GDP in FY06 to 7.5 percent in FY07 and FY08.** The large fiscal deficit stabilized in FY08 despite increased public spending (from 33.4 percent of GDP in FY07 to 34.6 percent in FY08) to accommodate increases in food and fuel subsidies (up to 9.7 percent of GDP from 7.4 percent last year). On the revenue side (28 percent of GDP), tax revenues were relatively stable in FY08 (around 15.3 percent of GDP). In FY09 increased government spending (which constituted a lower share of GDP than the prior year -- 33.9 percent) and forgone revenues[6], as announced within the fiscal stimulus package, resulted in a lower deficit of 6.9 percent of GDP.

2. **The Government is still facing the challenge of managing a large fiscal deficit and a sizeable public debt stock**, especially as the global environment turned unfavorable for Egypt. This section examines the medium-term economic prospects and possible risks emanating from Egypt's public debt level.

3. **Real GDP growth is expected to fall in tandem with the rest of the world,** particularly in the United States and Europe, Egypt's two main trading partners. Egypt's real economy was already hit by the global economic slowdown, as real GDP growth fell from around 7 percent during the three previous years to 4.7 percent in FY09. However, this is higher than the previously expected 3-3.5 percent, keeping Egypt among the best performers in the region. Given this positive outcome, we expect slightly higher growth in FY10. Assuming that the global economy will begin recovering in 2010, Egyptian growth is expected to stabilize around 5.5 percent in FY11, closer to its potential growth rate—the baseline assumption for the debt sustainability exercise.

4. Given the expected growth slowdown and the fiscal stabilization plan**, it is likely that the government will be unable to meet its target of cutting the fiscal deficit** by 1 percent of GDP per annum in the near term. In fact, falling international commodity prices (especially for food and energy) should help in reducing expenditures on subsidies. In FY09, the subsidy bill remained almost unchanged at around 9 percent of GDP. The FY10 budget allocated 5 percent of GDP for this item. Public debt simulations assume

[5] The general government provides the broadest available definition for Egypt's public sector in Egypt, which includes the budget sector (the central government, local administration units and service authorities), the NIB and the SIFs.

[6] The government has announced a reduction in tariffs and a one-year sales tax rebate to help importers of industrial inputs and capital goods. The cost of this measure is estimated at around EGP 1.7 billion.

that the primary deficit for the general government, currently at 2.7 percent of GDP, will start declining in FY10 and gradually reach a primary surplus of 2 percent of GDP by 2016, according to the government's fiscal plan.[7]

5. **During the past few years, the public debt to GDP ratio has declined significantly, a result of the high GDP growth rates that exceeded real interest rates.** Similarly, the real exchange rate has appreciated since 2005. In our projections, Egypt's debt outlook remains robust under various bound tests. Similar to the International Monetary Fund (IMF) projection, the World Bank exercise shows a significant decline in the debt-to-GDP ratio, though we anticipate a slower rate of decline during the immediate future due to the following factors: (i) the anticipated GDP growth slowdown to 5 percent in the next year; assumption that the US economy will begin to recover in 2010; (ii) a slight depreciation of the currency in the next two years, resulting from the subdued capital inflows and reduced demand for Egyptian exports; (iii) reduced inflation that limits the inflation tax resources in the short run; and (iv) higher international cost of financing debt roll-overs, as measured by the sovereign spreads. This improvement in the debt indicators is expected to continue after 2010, when GDP growth stabilizes at a higher plateau. As shown in the following table under the baseline scenario, net overall public debt declines to about 50 percent of GDP in FY14. The baseline scenario assumptions are summarized below.[8]

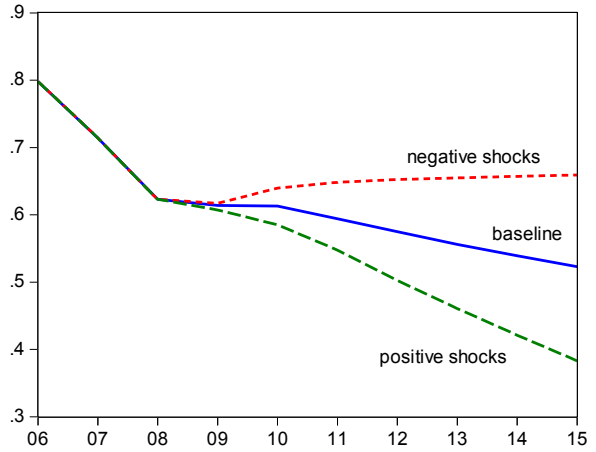


Figure 6: Public Debt to GDP Ratios – Actual and Projected

Main Assumptions for Debt Sustainability Analysis 2009-2014, Baseline Case (percent)

	2008	2009	2010	2011	2012	2013	2014
Real GDP growth	0.072	0.047	0.052	0.06	0.06	0.06	0.06
Real interest rate	-0.061	-0.01	0.01	0.015	0.015	0.015	0.015
Primary balance	-0.033	-0.029	-0.025	-0.01	-0.01	-0.01	-0.01
Inflation	0.161	0.15	0.090	0.07	0.0675	0.065	0.0625

[7] The government's plan targets the overall fiscal balance, and the announced target is a deficit of 3 percent of GDP to be attained in 2014, down from 8.2 percent programmed for this fiscal year. An overall fiscal deficit of 3 percent of GDP is consistent with a primary surplus of 2 percent of GDP given the projected path of interest payments.

[8] The analysis considers all the variables deterministic. The extension to do the analysis with stochastic variables is currently underway.

	2008	2009	2010	2011	2012	2013	2014
Exchange rate (LE/US$)	5.50	5.60	5.60	5.77	5.93	6.00	6.15
Sovereign Spreads (basis points)		250	150	100	100	100	100
Debt to GDP	0.623	0.606	0.600	0.585	0.566	0.537	0.500

Source: World Bank staff calculations.

6. Due to the current total expenditure level and budget deficit, it will be more prudent for the government to consider reallocating public capital expenditures over the next few years, including in the power sector.

Figure 7: Government Fiscal Operations, Public Debt, and Exposure to the Power Sector

		2007/08	2008/09	2009/10	2010/2011	2011/12	2012/13
		Actual	Preliminary	Projections	Projections	Projections	Projections
Total budgetary revenue and grants (LE bil.)		221.4	278.6	229.8	310.0	397.6	397.6
% GDP		24.7%	26.8%	19.0%	22.5%	25.5%	25.5%
Total budgetary expenditures (LE bil.),		282.5	350.5	331.3	398.2	484.9	484.9
% GDP		31.5%	33.8%	27.4%	28.9%	31.1%	31.1%
Overall budgetary balances (LE billion)		(61.1)	(71.9)	(101.6)	(88.2)	(87.3)	(87.3)
% of GDP		*-6.8%*	*-6.9%*	*-8.4%*	*-6.4%*	*-5.6%*	*-5.6%*
Government debt and guarantee, net (LE bil.)		557.9	629.3	725.6	806.1	882.5	882.5
(% GDP)		*62.3%*	*60.6%*	*60.0%*	*58.5%*	*56.6%*	*56.6%*
Nominal GDP (LE bil.)		895.5	1,038.5	1,209.3	1,377.9	1,559.2	1,559.2
			2008/09	2009/10	2010/2011	2011/12	2012/13
Estimated power sector incremental exposure			Estimate	Projections	Projections	Projections	Projections
Debt guarantee for state-owned entity (LE bil.)			6.4	9.6	11.7	17.3	18.6
Incremental GOE's exposure to the power sector / GDP			0.6%	0.8%	0.8%	1.1%	1.2%

Source: Ministry of Finance; World Bank staff estimates

Section 3 – Sources of Debt Financing

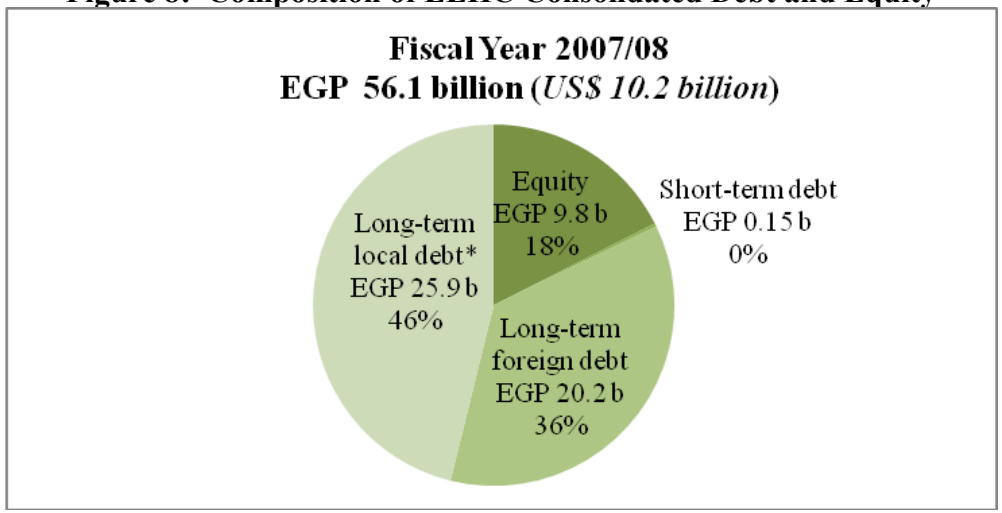
Egypt's power sector has benefited from both local and offshore debt financing. The range of financial products available from the banking market is comprehensive, including working capital, corporate and long-term project financing facilities. The National Investment Bank of Egypt – a public sector investment vehicle -- is the largest lender to the power sector, having lent about half of EEHC's active loans. The next largest lending group comprises development financial institutions. Furthermore, the local commercial banking market in Egypt remains liquid and is not significantly impacted by the global economic downturn. Debt capital market instruments remain of little use in the sector.

3.1 In-country sources

3.1.1 Local banks

- Local commercial banks have been providing project finance, corporate finance and working capital loan to the power sector. Loans made to EEHC are often denominated in EGP and are applied towards the local cost component of various capital investments. Working capital loans, mainly bank overdrafts, are also common. In FY08, the outstanding term loans from local commercial banks to EEHC amounted to EGP 2.8 billion (US$ 0.5 billion), plus about EGP 0.16 billion (US$ 0.03 billion) of bank overdrafts. **Therefore, loans from local banks represent about 6 percent of EEHC's total outstanding term loans.**

Figure 8: Composition of EEHC Consolidated Debt and Equity



Source: EEHC. * Long-term local debt includes EGP 23 billion from the National Investment Bank of Egypt (NIB).

- **The aggregate outstanding loans of the local banking sector in FY08 amounted to EGP 401 billion (50 percent of GDP[9]; US$ 73.0 billion)**, comprising EGP 267 billion (US$ 48.6 billion) in local currency and EGP 134 billion equivalent (US$ 24.4 billion) in foreign currency[10]. Most loans are corporate/commercial loans (almost 80 percent), with a typical repayment period of less than five years. Loans to the manufacturing sector, including the power sector, account for 36 percent of the total. Longer maturity loans, particularly those with repayment of more than ten years, are usually denominated in hard currencies. On aggregate, the local banking sector remains liquid as suggested by an average loan-to-deposit ratio of about 54 percent.

- Local currency loans are commonly lent on a floating interest rate basis, having the Central Bank of Egypt overnight deposit or lending rate as the benchmark. Good credit customers may expect a margin of about 1 to 2 percent over the overnight lending benchmark rate as of mid-2009. **As such, the costs of borrowing for good credit customers are around 11 to 12 percent per annum.**

Figure 9: Domestic Local Currency Interest Rates in Egypt

Percent per annum

Interest Rates	30-Jun-05	29-Jun-06	28-Jun-07	26-Jun-08	25-Jun-09
Central Bank overnight deposit	9.5	8.0	8.8	10.0	9.0
Central Bank overnight lending	12.5	10.0	10.8	12.0	10.5
Commercial bank 6-to-12-month deposit	7.7	7.1	6.9	7.1	7.8
Commercial bank less than 1-year loan	13.4	12.5	12.6	12.0	12.1

Source: Central Bank of Egypt

- **Egypt's banking sector has limited foreign loan and investment exposures[11], therefore, it is less impacted by the ongoing global credit crisis.** On the other hand, the funding base of local banks is substantially *local* deposits, amounting to EGP 548 billion (US$ 99.6 billion) in local currency and EGP 193 billion (US$ 35.1 billion) in foreign currencies; the non-deposit funding base such as bonds or other borrowings by banks is a small EGP 22.2 billion (US$ 4 billion). As such, local banks are also shielded from the current global liquidity crisis. Nevertheless, many banks have indicated that the global economic downturn will negatively impact a number of their export-oriented clients, and that local banking liquidity will likely decline as the country's savings rate declines.

- **Local banks also provide financing to the BOOT, but this is mostly denominated in hard currencies.** As such, the maturity of the loans was usually in excess of ten years, which was attractive to project developers. Moreover, the

[9] GDP at market price for FY08 was EGP 798.1 billion.
[10] Source: Central Bank of Egypt
[11] By FY08, foreign loans account for less than 2 percent of total loans. In the same period, balances with bank abroad account for about 11 percent of total assets.

interest rate basis on these loans can be swapped from a floating rate (e.g. USD LIBOR) to a fixed rate. For the first BOOT project, Sidi Krir (unit 3 & 4), local banks provided about US$ 164 million out of US$ 279 million of the project financing package. The latest development in BOOT financing was the refinancing of Gulf Suez and Port Said in 2008, which saw local banks joining a consortium of international banks in the financing.

- Some local banks that were interviewed in July 2009 indicated that they are following public-private partnership transactions in Egypt closely, including in the power sector. **For *local currency loans*, a private power project that requires about US$ 350 million equivalent of project debt would require not less than five banks to lend to such a project, either on a club or syndication basis.** The bankers indicated that the interest rate on such loan could not be fixed over the life of the loan; however, a shorter fixed rate period of 3 – 5 years would be more likely.

- Local-currency project finance loans for the power sector, as well as other PPP projects, are limited in amount and tenor. Some local banks, however, are endeavoring to extend the tenor on the back of their current liquidity; this is supplemented by the banks having longer maturity sources of funds via certificates of deposit. Based on the interviews, **a repayment period of up to fifteen years for local-currency project finance loans is being worked out.** This development is in parallel to mortgage loan developments in Egypt, suggesting that local banks are attempting to extend their local-currency loan maturity while gaining experience managing their assets and liabilities exposure.

3.1.2 Local debt capital market

- **To date, debt capital market (DCM) instruments – bonds, debentures, etc. – have not been used by power sector entities for fundraising.** The DCM in Egypt remains small, with the government as the main issuer. By end FY08, the outstanding treasury bills (up to 1 year maturity) totaled EGP 146 billion (US$ 26.5 billion) and treasury bonds (more than 1 year maturity) totaled EGP 71.5 billion (US$ 13 billion). The size of the corporate bond market is very small with a total bond outstanding of about EGP 6 billion (US$ 1.1 billion). Corporate bond tenor is commonly less than 7 years. The main DCM investors are commercial banks, insurance companies and pension funds.

- The Government is keen to expand the DCM market in Egypt, and it has been issuing more treasury bonds to help create a bond pricing benchmark. For the calendar year 2009 up to August, there were 8 issuances totaling EGP 32.5 billion (US$ 5.9 billion) the longest tenor of which was 7 years[12]. As the corporate bond market deepens in Egypt, EEHC could become a key bond issuer given its position as an important state-owned enterprise with large and continuing financing needs. Such a move would help diversify EEHC's sources of funds for the future.

- DCM is not expected to play a major role in the power sector financing over the next five years.

[12] The longest tenor treasury bond still outstanding is a 15-year bond issued in 2005 for EGP 1 billion at a 11.4percent coupon. Source: Egypt Ministry of Finance

3.1.3 Others (non-bank FIs)

- The key non-bank financial institutions in Egypt are pension funds, insurance companies, and mutual funds. These institutions have not directly provided debt financing to the power sector. The aggregate investments of the pension funds and insurance companies by end FY08 amounted to EGP 292 billion (36 percent of GDP; US$ 53.1 billion), of which EGP 252 billion (US$ 45.8 billion) belong to the National Authority for Social Insurance, a public institution.

- A notable exception, however, is the National Investment Bank of Egypt (NIB), which is a government-owned public sector investment vehicle. **The NIB is currently the largest lender to EEHC; outstanding NIB loans to EEHC amounted to US$ 4.2 billion, or about 50 percent of EEHC's total outstanding long-term debt, at end FY08.** As such, the NIB has been the largest and most significant creditor of EEHC. The NIB is a large institution, with total financial resources of about EGP 192 billion at end FY08 (24 percent of GDP; US$ 34.9 billion; slightly smaller than the largest commercial bank, the National Bank of Egypt – assets EGP 224 billion). NIB acts as an investment vehicle for the Government and the general public, drawing substantially on the financial resources of public pension funds and individual savings via post office accounts.

3.2 Offshore sources

3.2.1 Commercial lenders

- **Offshore commercial lenders are a significant source of financing for Egypt's BOOT program.** Offshore commercial lenders participated in all three BOOTs, with the latest transaction being the refinancing of the Suez Gulf and Port Said East power plants in 2008, which saw participation from about 11 international and regional banks. There is no loan from offshore commercial lenders to EEHC at present.

- **The first BOOT, the Sidi Krir power plant (unit 3 & 4), raised about US$ 114 million of private offshore debt (supplemented by dollar-denominated local debt worth about US$ 164 million). This was followed by Port Said and Gulf Suez, which collectively raised about US$ 378 million of private offshore debt[13].**

- Interviews with a number of international commercial lenders indicate that offshore banks are more selective than in the past. The majority of bankers interviewed view Egypt as an attractive lending destination compared to other lower- and middle-income MENA countries. However, the prevailing credit and liquidity constraints, coupled with Egypt's lower

[13] Source: Working Paper 2005/1, University of Capetown Graduate School of Business, *The Egyptian IPP Experience*.

relative sovereign credit worthiness compared to the time of the first three BOOTs[14], make the lending situation more challenging. Project financing loans are being offered selectively; loan tenor is shorter (not uncommon to offer less than 10-year loan), banking on future refinancing; lending margins are higher due to liquidity and perceived risk premium (for US dollar loans, the lending margin to MENA countries has increased from the order of 100+ basis points to over 300 basis points); and risk mitigation from DFIs, multilateral development banks or the insurance market is generally required.

3.2.2 Development FIs (DFIs) and Multilateral Development Banks (MDBs)

- DFIs are a significant debt financing provider to the Egypt power sector. Their engagement is substantially with EEHC and its subsidiaries and affiliates. **As of June 2008, the outstanding loan from DFIs and multilateral development banks amounted to about US$ 3.6 billion, or about 44 percent of EEHC's total outstanding long-term debt.**

- Many DFIs and MDBs are active in Egypt's power sector, including regional DFIs such as the African Development Bank, the Arab Fund for Social and Economic Development, and the Kuwait Fund for Arab Economic Development; bilateral institutions such as the Japan International Cooperation Agency (JICA), Danish International Development Agency (DANIDA) and KfW; and multilateral institutions such as the World Bank Group.

- As for the BOOT, the IFC was an original lender to Port Said and Gulf Suez BOOTs.

3.2.3 Debt capital market

- There has been no bond issue by Egyptian power sector entities in the international debt capital market to date. A most likely scenario for this channel to be tapped would be a bond issuance by EEHC or an IPP, either to refinance its existing debt or to raise new funding. However, recapitalization of EEHC is likely to be a prerequisite for an international bond offering. Moreover, a credit enhancement may be required in order to extend the maturity of the bond.

[14] In the late 1990s and early 2000s, Egypt's sovereign ratings were in the BBB range. The ratings were cut to the BB range in 2002, and have remained at this range until now.

Section 4 – Sources of Equity Financing

The Government of Egypt – through EEHC and NREA – has been the largest equity investor in the power sector, with book value equity investment of over EGP 9.8 billion (US$ 1.8 billion) by end FY08. Private equity, totaling about US$ 350 million at the time, had entered the sector through the three private power projects (BOOTs) in the late 1990s and early 2000s. There has since been no further greenfield grid-connected private generation investment in the sector.

For the next seven years, EEHC is expected to self-finance part of the EGP 117 billion (US$ 21.3 billion) planned investment program. However, more private investment will be needed to alleviate EEHC's debt burden. Despite the global economic downturn, many investors remain interested in the Egyptian power sector, as evidenced by the strong interest shown in the ongoing selection process for a 250 MW wind IPP developer.

4.1 In-country sources

4.1.1 Government / Electric utilities

EEHC and NREA

- **The Government of Egypt is the sole owner of EEHC, NREA, and it is the largest equity investor in the domestic power sector.** The book value of EEHC group's equity amounted to EGP 9.8 billion (US$ 1.8 billion) as of June 2008[15]. This is about 10 percent of the consolidated assets of EEHC.

- As a holding company, EEHC contributes a certain portion of its own cash resources, together with borrowed funds, in financing new investment projects. According to EEHC, about 10 to 20 percent of a new project cost is contributed by EEHC's own resources. In the past three fiscal years, EEHC's net operating cash flow was on the order of EGP 3 – 6.7 billion (US$ 0.5 – 1.2 billion) per year.

- Due to its high leverage (liabilities-to-equity ratio greater than 8 times), EEHC is in need of a recapitalization in order to maintain its debt servicing capacity. However, as elaborated in Section 2, Egypt's fiscal space is constrained and may limit additional government equity injection. An alternative considered by the Egyptian authorities and EEHC is a debt-

[15] Source: EEHC financial data is from World Bank Project Appraisal Documents and Staff estimates

to-equity conversion of the loan from the state-owned National Investment Bank of Egypt. This issue is elaborated further in Section 5 (paragraphs 7 and 11).

- NREA is currently implementing a number of sizable wind and solar power projects, and its assets are estimated to increase from about EGP 2.2 billion (US$ 0.4 billion) in FY06 to EGP 7.8 billion (US$ 1.4 billion) in FY10[16]. NREA's internally-generated cash resources go substantially toward funding current projects and servicing debt. Therefore, NREA is not expected to be a major source of equity in the next few years.

Existing BOOTs

- **The ultimate majority owner of the three BOOTs is currently Tanjong Public Limited Company[17].** Tanjong wholly owns Suez Gulf and Port Said East power stations, and majority owns Sidi Krir power stations (unit 3 and 4). Tanjong bought Suez Gulf and Port Said East outright from EDFI (France) in 2006. It then became the majority owner of Sidi Krir following its acquisition of the then owner Globeleq (UK) in 2007, in partnership with Aljomaih Automotive Company of Saudi Arabia.

- According to its management, the Tanjong group is keen to invest further in the Egyptian power sector, either in an existing asset or a greenfield project. This is a positive reflection of the private sector experience in Egypt.

4.1.2 Commercial investors

- **Apart from about 265 MW of isolated power plants serving scattered load pockets, commercial investors involved in the power sector value chain have not invested as equity investors to date.**

- According to the management of a major local construction company, the power sector is considered to be generally attractive for commercial investors given its economic significance. This is evidenced by the strong expression of interest among potential investors in the 250 MW wind IPP currently being solicited by EETC/EEHC.

- The government is now considering more ways for the private sector to enter the power sector. These are expected to include mandating large electricity users to self-source electricity from private power suppliers. Such an initiative should help reduce public capital expenditures and financing requirements as elaborated in Section 1.

[16] Source: World Bank Project Appraisal Document – *Kureimat Integrated Solar Combined Cycle Power Project, November 2007*

[17] Tanjong power business is concentrated in Malaysia (1.49 GW), Egypt (1.74 GW) and Bangladesh (0.47 GW). Its consolidated assets totaled US$ 3.7 billion and shareholders' equity totaled US$ 1.1 billion by January 2009. The company is incorporated and domiciled in England. Source: Tanjong Plc.

4.1.3 Financial investors

- **Similar to commercial investors, local financial investors -- such as mutual funds, pension funds and private equity fund – have not invested equity in the power sector.**

- However, as part of the government's effort to re-engage the private sector in power generation, the government (through the Ministry of Electricity and Energy, EEHC, and the regulator) has held discussions with potential financial investors who are keen to develop power stations. The details of the commercial framework are being worked out, and as such, this assessment assumes that one thermal power station (750 MW) will be developed in the next seven years by a private investor group. A thermal power station would require an investment of about US$ 0.75 – 1.0 billion.

4.2 Offshore sources

- **To date, the first 3 BOOTs have represented the only offshore private equity investment in the Egyptian power sector.** About US$ 350 million of private equity had entered the sector through the 3 private power projects (BOOTs) in the late 1990s and early 2000s. The first BOOT, Sidi Krir (unit 3 & 4), was originally owned by InterGen (US) and Edison SpA (Italy), and subsequently by Globeleq (UK). The next 2 BOOTs, Port Said and Gulf Suez were originally owned by EDF International (France)[18]. All three are now ultimately owned by Tanjong (UK) – see Section 4.1.1.

- Despite the ongoing financial crisis, Egypt's power sector continues to attract strong interest from potential offshore investors. This is evidenced by the large number of investors having been pre-qualified for the 250 MW wind IPP currently being prepared by EETC/EEHC[19]. This project will be the first follow-up IPP in Egypt since the first three BOOTs were closed a decade ago.

[18] Source: Working Paper 2005/1, University of Capetown Graduate School of Business, *The Egyptian IPP Experience*.
[19] According to the Ministry of Electricity and Energy, 72 international companies had bought the bidding document and 32 have been pre-qualified.

Section 5 – Funding Gap Analysis and Potential Supports

The global economic downturn, credit and liquidity constraints have only had limited immediate impact on the financing of the Egyptian power sector. This is because all major ongoing sector investments (as much as 7,000 MW of generation capacity and associated transmission and distribution infrastructure) are being carried out by the public sector, which obtained financing commitments prior to the crisis. To date there has been no major project cancellation.

However, the next round of planned capital investment is estimated to be on the order of EGP 117 billion (US$ 21.3 billion). Of this amount, private investment is initially estimated to be EGP 8 billion (US$ 1.5 billion) and public investment is estimated to be EGP 109 billion (US$ 19.8 billion). This planned investment is substantially larger than actual investment in the past five years. Financing of this investment amount will be a challenge, due to public sector companies' deteriorated financial position, high indebtedness, and the private sector financing environment that has grown more difficult. The financing plan for a number of of these planned projects is not readily available, and may result in schedule slippage. Bold measures on the policy front will be required to help bring about a successful investment program, including interrelated policies on, inter alia, creating a commercial framework for private investment in the power sector; electricity tariffs; and public utilities' capital structure and investment program.

In addition to the detailed investment plan elaborated in Section 1, this section focuses on planned generation projects with initial operations scheduled for FY 2014/15. The following assessment (numbered points below) is related to Figure 10, which appears at the end.

1. At least two public generation projects with a combined capacity of 2,600 MW obtained financing commitments in FY 2008/09. The World Bank is partially financing the 1,300 MW Ain Sokhna project currently under construction. These two projects are the latest components of the 7,000 MW generation expansion program that have obtained financing commitments and are under various stages of construction.
2. Upcoming *planned* public projects include eight thermal projects to be developed by EEHC. These projects are estimated to cost as much as EGP 67.5 billion (US$ 12.3 billion) in total.
    - The World Bank is currently appraising the 1,500 MW Giza North project.
    - EEHC has included the AfDB, Arab Fund, Kuwait Fund and World Bank in the financing plan for the 1,300 MW Helwan South (ii) and 1,300 MW Qena projects.

- Financing plans for the 750 MW Nuwaiba, 750 MW Banha, 1500 MW Qassasen and 650 MW Suez projects have not yet been made available by EEHC. The Nuwaiba and Banha projects (each a 750 MW CCGT) are expected to start initial operations in FY 2012/13. In order to meet the planned schedule, financing commitments must be on the project critical path by now.

3. In addition, NREA is expected to carry out three wind power projects, about 440 MW in total, and at least one concentrated solar power project. These projects are estimated to cost EGP 7 billion (US$ 1.3 billion) in total.
   - NREA has obtained grants and soft loans for the financing of its wind projects.
   - A regional concentrated solar power (CSP) investment plan has been approved by the Clean Technology Fund (CTF). The CTF intends to provide up to US$ 750 million of soft financing for CSP investment in the MENA region, of which US$ 95 million is the indicated amount available for Egypt. Egypt, through NREA, has planned to request CTF financing support for its CSP projects. Other donors, development financial institutions and the World Bank are expected to be approached to help finance these projects.
4. Contemplated private projects include at least one large thermal power project, a 120 MW captive wind farm, and a 250 MW wind IPP. Collectively, these projects are estimated to cost about US$1.5 billion, and may require about a billion dollars of debt financing. The financing phase of these projects is expected in the coming three years.
   - Debt financing may come from multiple sources, including commercial lenders, export credit agencies, and the private sector window/arm of development financial institutions and multilateral development banks.
   - Depending on the lending group, some lenders (particularly international commercial lenders) may require risk mitigation supports such as those provided under export credit facilities and World Bank Group guarantee instruments.
   - Under the contemplated project schedule, the above-mentioned projects will be facing a tight credit market situation and/or its fallout. The risk of these projects being delayed is substantial, especially for the thermal power project, where the underlying commercial framework to engage private investors is incomplete. This issue is elaborated further in the following pages.

Figure 10: Upcoming projects with initial operations planned by FY 2014/15

Project	MW	Technology	Implementation Status	Estimated Cost (US$ million)	Expected Initial Operation	Note on financing
Projects obtained financing in 2008-2009						
Abu Krir	1300	Steam	Under construction	1,716	2012	Debt financing from IsDB, Kuwait Fund, OPEC Fund
Ain Sokhna	1300	Steam	Under construction	2,222	2013	Debt financing from AfDB, Arab Fund, World Bank
	2600			3,939		
Upcoming public projects						
Nuwaiba	750	CCGT	Financing phase	865	2011	Financing plan not readily available
Giza North	1500	CCGT	Financing phase	1,349	2013	Expected debt financing from EIB, OPEC Fund, World Bank
Banha	750	CCGT	Planning stage	819	2012	Financing plan not readily available
Qassasen	1500	CCGT	Planning stage	1,349	2013	Financing plan not readily available
Suez	650	Steam	Planning stage	1,238	2014	Financing plan not readily available
Helwan South (i)	1300	Steam	Planning stage	2,220	2015	Expected debt and equity financing by a Libyan developer
Helwan South (ii)	1300	Steam	Planning stage	2,220	2017	Expected debt financing from AfDB, Arab Fund, Kuwait Fund, World Bank
Qena	1300	Steam	Planning stage	2,220	2015	Expected debt financing from AfDB, Arab Fund, Kuwait Fund, World Bank
NREA wind project	120	Wind	Financing phase	240	2010	Expected financing from Danida
NREA wind project	120	Wind	Financing phase	240	2011	Expected financing from JICA
NREA wind project	200	Wind	Financing phase	400	2014	Expected financing from KfW
Concentrated solar power	100	CSP	Planning stage	400	2013	Expected debt financing from the Climate Technology Fund,
Total - public	*9590*			*13,560*		bilateral development agencies and World Bank
Upcoming private projects						
Natural gas-based IPP	> 750	To be determined	Planning stage	750	2012	Private financing. May include loan and/or risk coverage from
Wind 120MW - captive	120	Wind	Planning stage	240	2012	export credit agencies, bilateral development financial institutions,
Wind 250MW - BOO	250	Wind	Developer selection stage	500	2013	multilateral development banks (e.g. World Bank), and the private
Total - private	*> 1,120*			*> 1,490*		insurance market.

Source: EEHC as of October 2009 ; World Bank staff estimates.

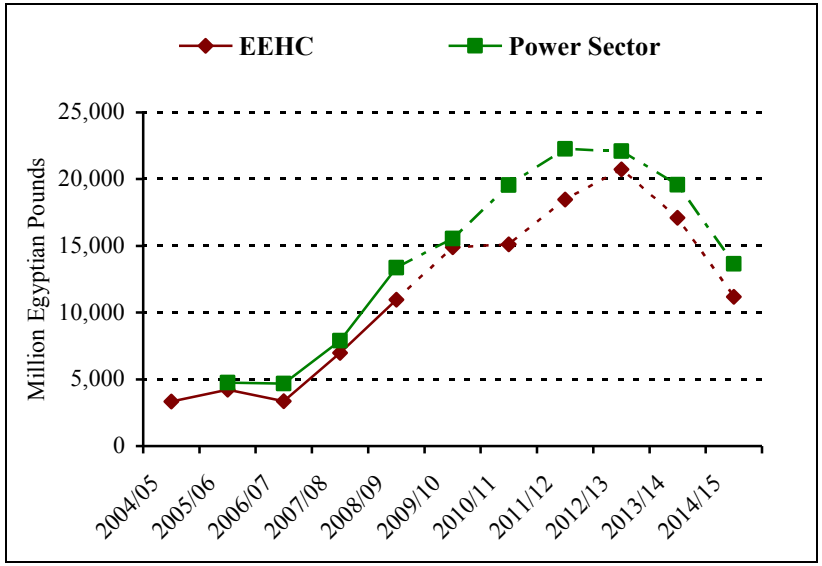
Financing Challenges

5. **The financing challenges are significant** because, *inter alia*, investment needs in the coming period will be much higher than in the recent past; the financial position of EEHC is worse than it was several years ago; a framework for private investment is incomplete (with the exception of wind power, which is relatively small in terms of installed capacity); and the tight credit market situation.

6. **An assessment of EEHC's financial position has identified that the company will be highly leveraged if it carries out capital investment as planned. A funding gap may arise due to potential difficulties in raising all required debt financing.**

   - EEHC's net capital investment has ranged from EGP 3.3 billion (US$ 0.6 billion) to 11 billion (US$ 2 billion) over the past five fiscal years. Planned investment is estimated to exceed these amounts, representing a step increase in the next five years.

Figure 11: EEHC Net Capital Investment and Overall Power Sector – Actual (up to FY 2008/09) and Estimated



Note: The estimate for EEHC includes projects that appear on Figure 5 and other prior projects which are under various stages of implementation.

   - EEHC's leverage is estimated to approach 12 times its equity in the next four years (up from 8 times in 2008/09) if it substantially finances the contemplated investment program with debt as it has done in recent years. Such high leverage could lead to debt servicing difficulty in the next few years of heavy capital investment, particularly if electricity tariffs

are not adequately increased to cover operating costs. The situation will be even more acute if there is an unforeseen increase in operating costs such as a spike in liquid fuel, raw materials or equipment costs.

7. **Current key lenders may soon reach their exposure limits for EEHC. EEHC's high leverage and inability to fully service debt obligations are its main barriers to accessing additional debt financing.**
   - EEHC's main local lender is the National Investment Bank of Egypt, which has total EEHC loans outstanding of EGP 24.8 billion (US$ 4.5 billion) at end FY 2008/09. The NIB seems to have reached its exposure limit with EEHC since there have been no further disbursements in at least the last five years. In fact, EEHC has not been servicing its debt obligation to the NIB fully, resulting in accrued interest being added to loan principal in recent years[20].
   - EEHC's primary foreign lenders are bilateral development financial institutions and multilateral development banks such as the World Bank. This group of lenders' exposures to EEHC have increased in recent years with total loans outstanding of EGP 20.7 billion (US$ 3.8 billion) at end FY 2008/09[21]. (See also Figure 8.)
   - The above mentioned *planned* eight thermal projects are estimated to cost as much as EGP 67.5 billion (US$ 12.3 billion) in total. If EEHC carried out these projects, the required debt financing would be likely to exceed the current foreign creditors outstanding loan balance of US$ 3.8 billion. These lenders will eventually be restricted by their credit exposure limits, thus making it difficult for them to extend sizable new loans to EEHC.
   - It follows that EEHC may have to approach new lenders to help finance *planned* projects. However, EEHC's high leverage and inability to fully service its debt obligations are serious barriers to accessing further debt financing, either from existing or potential new lenders.
   - **The World Bank has been monitoring EEHC's leverage and liquidity position, and it will discuss the financial position of EEHC with a view toward reaching an understanding with the Egyptian authorities on sustainable leverage and liquidity positions of EEHC as part of the Giza North project appraisal process.**

<u>Roadmap toward a successful investment program</u>

8. **The Egyptian authorities may consider increasing private sector investment in generation more than currently planned in order to alleviate EEHC and NREA's debt burden over the next five years, a crucial period.** However, financing of private projects will be challenging due to the prevailing economic conditions in Egypt and abroad.

[20] The outstanding balance of the NIB loan had increased from EGP 23.06 billion at end FY 2007/08 to EGP 24.8 billion at end FY 2008/09. It is estimated that EEHC paid about a quarter of interest payable for the year under the loan. The remaining interest payable is added to the loan principal. Source: World Bank staff estimate.

[21] The World Bank has in recent years approved two loan facilities for EEHC, totaling about EGP 4.7 billion (US$ 259.6 million in 2006 and another US$ 600 million in 2009).

- Assuming that three of the *planned* public projects are instead developed by the private sector, the estimated project costs could amount to over US$ 5 billion, and may require over US$ 4 billion of debt financing. This scenario is a crucial one as the required debt financing is large and the timing of financing commitments is tight.
- The authorities may consider **spreading out private participation** over the current planning horizon to help alleviate the pressure on the private financing market (see paragraph 12 below). A practical scenario could be to introduce one or two private plant(s) per year, incorporating the plan for the aforementioned private thermal project, a 120MW captive wind farm, and another 250MW IPP wind farm.
- To facilitate private financing, risk coverage provided by export credit agencies, development financial institutions and multilateral development banks such as the World Bank Group can be explored.

9. **Streamlining the private sector engagement framework.**

- **There has been no major private investment in the Egyptian power sector since the three BOOT projects in the late 1990s and early 2000s.** The three BOOTs entered into long-term power purchase agreements with EEHC and have benefited from the Central Bank of Egypt's guarantee. Project financing of these projects was closed during the time when Egypt's sovereign credit ratings were at investment grade levels (BBB range). The credit ratings have since been downgraded to sub-investment grade (BB range).
- Egypt is currently soliciting the 250 MW wind IPP based on a similar risk allocation framework as those of the three BOOTs. **However, a private sector engagement framework for future private thermal power projects is not yet in place.** This is a major issue, which is closely linked to the success of the envisaged capital investment program.
- **The current economic downturn, international liquidity constraint, and Egypt's deteriorated credit ratings will make private project financing more difficult.** This assessment has indicated that commercial loan tenor can be shorter than 10 – 15 years, with higher interest margin (over 300 basis points for US dollar loans). The assessment also found that international commercial lenders who remain active in power project financing do require greater risk mitigation at the project level, as well as risk coverage from a third party such as export credits, multilateral development banks or the insurance market. However, the low international interest rate environment can still provide a commercially viable all-in interest rate to a well-structured project.
- **At the project level, a rather conservative risk allocation among project counterparts could help to increase a project's bankability under a tight credit market.** Projects with lower demand risk, a secure source of fuel supply and raw materials, a pass-through cost structure for tariffs, a well-defined *force majeure* and termination mechanism, a strong or enhanced off-taker credit standing, among other conditions, will be most palatable to commercial lenders under the prevailing tight credit condition. Jordan's Al-Qatrana IPP project is the most recent proof of the attractiveness

of such a structure[22]. According to the IFC, a number of countries in the Gulf Cooperation Council are offering long-term power purchase agreements and government guarantees to attract project financiers.

- Also at the project level, **projects with more demand uncertainty -- such as those with partial off-take agreements -- will be less competitive in accessing project finance.** Willing lenders, if any, will put a risk premium on such projects, which translates into higher electricity tariffs.

- Other key issues that will require further consideration are:
  (i). **Compatibility of EEHC's selling tariff versus IPP selling tariff.** For example, starting in July 2008 EEHC's highest tariff for *very* high voltage industrial users was 20.2 piasters per kWh (3.7 US cents) and for high voltage users was 24.5 piasters (4.5 US cents)[23]. These tariffs are substantially lower than the average cost of power generation by a greenfield thermal power station developed on commercial terms[24]. The private sector engagement framework must address this tariff differential in order to attract industrial users to the higher-cost IPP power and to ensure successful project financing.

  (ii). **Market risk and demand uncertainty of an IPP.** As indicated above, a project with more demand uncertainty will be less competitive in accessing project finance. The engagement framework that adequately addresses market risk and demand uncertainly will increase the likelihood of successful project financing.

  (iii). The choice of generation technology, project site, plant size, fuel supply, procurement methodology and back-up power arrangements are other key issues to be considered for the engagement framework.

10. **Contemplate an interim arrangement similar to the wind IPP and the three BOOTs.** The three BOOTs successfully attracted foreign investment, brought in quality operators and resulted in competitive tariffs. Although the BOOTs' tariffs had increased in local currency terms following a devaluation of the Egyptian pound in 2003, the average cost of purchased electricity from the BOOTs was around 15 piasters per kWh (2.7 US cents) in FY 2006/07 and FY 2007/08, *including* the cost of fuel. The authorities and EEHC may consider revisiting this proven structure, but should include provisions to improve risk allocations. For example, authorities and EEHC may consider increasing the relative weight of local currency in the tariff formula as a way to mitigate currency risk at the project level. Further, the power purchase and related agreements may include

[22] The second IPP Al-Qatrana project in Jordan successfully closed its financing in October 2009. As much as US$ 340 million of project financing was reportedly raised, including direct loans from the Export-Import Bank of Korea, the Islamic Development Bank and from commercial lenders. The Export-Import Bank of Korea also provided risk coverage, which facilitated lending by at least two commercial international lenders new to Jordan power sector: BNP Paribas and KfW Ipex-Bank. (Source: Chadbourne & Parke LLP; World Bank staff assessment)
[23] Source: EEHC Annual Report 2007/2008.
[24] The latest commercially developed thermal power station achieving financing commitment in 2009 is a 373 MW combined-cycle IPP in Jordan. The project has a levelized tariff of about five US cents per kWh, based on natural gas price of US$ 3.5 per million British thermal units.

provisions that provide flexibility in moving from a single-buyer model toward other power market models. Moreover, the government guarantee can be streamlined and reviewed in relation to Egypt's fiscal space.

11. **Recapitalization of EEHC to support planned capital investment.** At the end of FY 2007/08, EEHC's liabilities-to-equity ratio was more than 8. There has been an ongoing discussion about converting debt from the National Investment Bank of Egypt into equity. If materialized, the conversion would reduce EEHC's leverage ratio to around 2, and save about EGP 2 billion (US$ 0.4 billion) per year in interest charges, which is about two-thirds of total interest expenses in FY2007/08. A partial recapitalization will also help reduce EEHC's leverage level and ready the company for future growth.

12. **Sequencing of public and private projects – alleviate debt burden of public entities and reduce financing bottleneck:**

- Figure 12 illustrates an example of project sequencing based on the expected initial operation date. **This example shows a reduced capital investment program for EEHC (US$ 5.2 billion instead of US$ 12.3 billion as currently planned).** The estimated equity requirement (20 percent of estimated costs) can be met by EEHC's annual internal cash resource. The estimated debt financing of US$ 4.2 billion to be disbursed over the next seven or more years is more manageable, especially if accompanied by a recapitalization. As indicated in paragraph 7 above, the World Bank will discuss with the Egyptian authorities the issues of EEHC leverage and a liquidity position that would ensure a sustainable investment program.

- **The potential private projects are spread out, which should help reduce private financing bottlenecks.** The estimated private debt financing is less than US$ 2 billion per project, with projects scheduled to start earlier requiring a lower debt amount. Nevertheless, this example still represents a financing challenge since a US$ 5.8 billion debt commitment will be required in the next 3 – 4 years. Debt financing may come from multiple sources, including local and foreign commercial banks, export credits and DFIs. It is likely that the projects that come to market earlier will see more direct loan from DFIs (such as the IFC) as a way to extend debt maturity to more than 10 - 15 years. These projects can also benefit from local currency loans from local commercial lenders, provided that a floating interest rate pass-through mechanism is included in the tariff formula. As indicated in Section 3.1, US$ 350 million in project debt is considered sizable and would require not less than five local banks to lend. As such, it follows that larger projects, such as those that would require more than US$ 500 million in debt, would need international lenders on board.

Figure 12: Sequencing of upcoming public & private projects – an illustrative example

Project	MW	Technology	Estimated Cost	Estimated Debt	Estimated Equity	Expected Initial Operation	Note on financing
Potential EEHC projects			US$ million	US$ million	US$ million		Equity funded by EEHC internal
Nuwaiba	750	CCGT	865	692	173	2012	cash resource (about US$ 1 billion
Giza North	1500	CCGT	1,349	1,080	270	2013	in FY 07/08 and FY 08/09).
Banha	750	CCGT	819	655	164	2012	
Qena	1300	Steam	2,220	1,776	444	2015	Lower debt financing, spread over
Total - public	*4300*		*5,253*	*4,202*	*1,051*		multiple years.
Potential private projects							
Natural gas-based IPP	> 750	To be determined	750	563	188	2012	Private equity not excessively large for
Qassasen	1500	CCGT	1,349	1,012	337	2013	each project.
Suez	650	Steam	1,238	929	310	2014	
Helwan South (i)	1300	Steam	2,220	1,665	555	2015	Multiple sources of debt financing,
Helwan South (ii)	1300	Steam	2,220	1,665	555	2017	including local and foreign banks,
Total - private	*> 5,500*		*> 7,777*	*5,833*	*1,944*		export credits, DFIs

13. **Potential Support from the World Bank Group**

- As indicated above, the World Bank is appraising the Giza North project currently being developed by EEHC. As part of the appraisal, the Bank will work with the Egyptian authorities to help develop a feasible sector investment strategy and to build on ongoing policy activities (elaborated below). The Bank will also discuss the financial position of EEHC with a view toward helping to define a path for a financially sound power sector, a more financially independent EEHC, and a sustainable investment program of public power entities.

- This appraisal follows the US$ 259.6 million loan for the El-Tebbin project approved in February 2006 and the US$ 600 million loan for the Ain Sokhna project approved in January 2009. The World Bank's lending supports the ongoing policy dialogue with the Government of Egypt related to power sector reform. Three important policy activities include (i) an energy pricing strategy; (ii) a commercial framework for large-scale wind development; and (iii) a framework and risk allocation mechanism for re-engaging the private sector in power generation. On electricity tariffs, end-user electricity tariffs in Egypt have been raised, *inter alia*, to better reflect the cost of supply, to reduce inefficient power consumption, and to ensure sustainable investment in the sector. The commercial framework for large-scale wind development has been developed and is currently being used in the ongoing solicitation of the 250 MW wind IPP. The third activity, to develop a framework for re-engaging the private sector in thermal power generation, is ongoing.

- The IFC was a pioneering lender to two BOOT projects in Egypt. The IFC is keen to support the next private power investment in Egypt, and has participated in the dialogue with the Government of Egypt on re-engaging the private sector in power generation. Moreover, the IFC sub-national financial products offer financial alternatives available to sub-national entities such as EEHC and its group of companies. MIGA products will also be relevant for future private power projects in Egypt.

14. **Summary of required support for the Egypt power sector**

Generation:

- The upcoming public generation projects will need financing supports.
- The government may need further technical assistance to re-engage the private sector in power generation. This may include, *inter alia*, developing of a policy and commercial framework for private sector engagement; sequencing exercise of public and private projects pipeline; managing contingent liabilities stemming from private sector engagement.
- The government may need technical assistance to determine whether a floating interest rate mechanism should be provided to IPP.
- The upcoming IPPs will require risk mitigation and possibly co-financing by bilateral DFIs and multilateral development banks.

- Some potential IPP investors may need risk mitigation support for their equity investment.

Transmission & Distribution:

- EEHC/EETC/distribution companies will be looking for debt financing for their investment program over the coming seven years. A combination of commercial and concessional loans is envisaged. Commercial lenders may be interested in some form of liquidity or credit support to facilitate lending.

Commercial lenders:

- Apart from risk mitigation support, some commercial lenders may need liquidity support, especially for longer-tenor project financing loan.

Equity investors:

- Equity investors may need risk mitigation support from bilateral DFIs, multilateral development banks and from the insurance markets.

EEHC in Figures

Million Egyptian pounds

	Unit	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09
		actual	actual	actual	actual	actual
GWh sold	GWh	85,781	92,829	98,812	107,226	112,611
Average tariff	EGP / kWh	0.141	0.152	0.162	0.174	0.187
Electricity sales	EGP million	12,074	14,072	15,968	18,687	21,024
Total revenue	"	12,861	15,134	17,285	20,357	23,003
EBITDA	"	3,966	5,004	5,961	7,224	8,081
Net income	"	415	508	768	874	1,742
Increase (decrease) in working capital, excluding cash	"	252	2,224	(1,761)	(2,874)	(2,241)
Operating cash flow, net	"	2,286	3,073	3,666	6,701	7,249
Investing cash flow, net	"	(3,339)	(4,213)	(3,362)	(6,993)	(10,976)
Financing cash flow, net	"	661	1,349	223	1,961	4,325
Cash ending balance	"	1,777	1,986	2,513	4,182	4,781
Total assets	"	68,629	75,836	82,902	96,638	109,182
Total liabilities, of which	"	60,771	67,346	73,696	86,807	97,498
Long-term debt, gross	"	30,307	36,470	39,294	46,107	51,689
Past due liabilities*	"	11,870	12,478	27,020	31,166	35,289
Total equity	"	7,857	8,490	9,206	9,831	11,684
Financial ratios						
EBITDA margin	%	31%	33%	34%	35%	35%
Net margin	%	3%	3%	4%	4%	8%
DSCR - EBITDA**	times	1.0	1.1	1.1	1.2	1.2
DSCR - net operating cash flow***	times	1.1	1.2	1.2	1.7	1.7
Self-financing ratio	%	12%	25%	37%	58%	42%
Current ratio	times	0.5	0.6	0.6	0.6	0.6
Liabilities-to-equity raio	times	7.7	7.9	8.0	8.8	8.3
Long-term debt-to-equity ratio	times	3.9	4.3	4.3	4.7	4.4
Annual % change - GWh sold	%	6.4%	8.2%	6.4%	8.5%	5.0%
Annual % change - average tariff	%	7.1%	7.7%	6.6%	7.8%	7.1%

* Past due liabilities are largely loan obligations to the Ministry of Finance. These loans are gradually being setoff against the cost of electricity supplied to governmental users.

** EBITDA divided by previous year current portion of long-term debt and interest expenses for the year

*** Operating cash flow -- net of change in working capital, excluding cash and current portion of long-term debt -- divided by previous year current portion of long-term debt and interest expenses for the year