SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

SIGIR

THE ELECTRICITY STORY

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Al-Musayab thermal power plant

Electric Power in Iraq Before 2003

Electric power first came to Iraq in 1917, when it was used to run machines and provide limited street lighting, but large power plants were not built until the 1970s and 1980s. Those plants—including Doura, Baiji, and al-Musayab—were mostly oil-fired thermal plants. By 1990, Iraq had one of the leading electric utilities in the Middle East. Total nameplate generating capacity was 9,295 MW, almost twice peak demand, and about 9 out of 10 Iraqis had access to subsidized electricity.

Damage from the 1991 Gulf War reduced available capacity to 2,325 MW, resulting in widespread power shortages and a halving of per capita consumption. The ensuing UN sanctions caused construction of three large new plants to halt. At the same time, they made it difficult for Iraqis to obtain electric appliances and machinery, which suppressed the growth of demand.

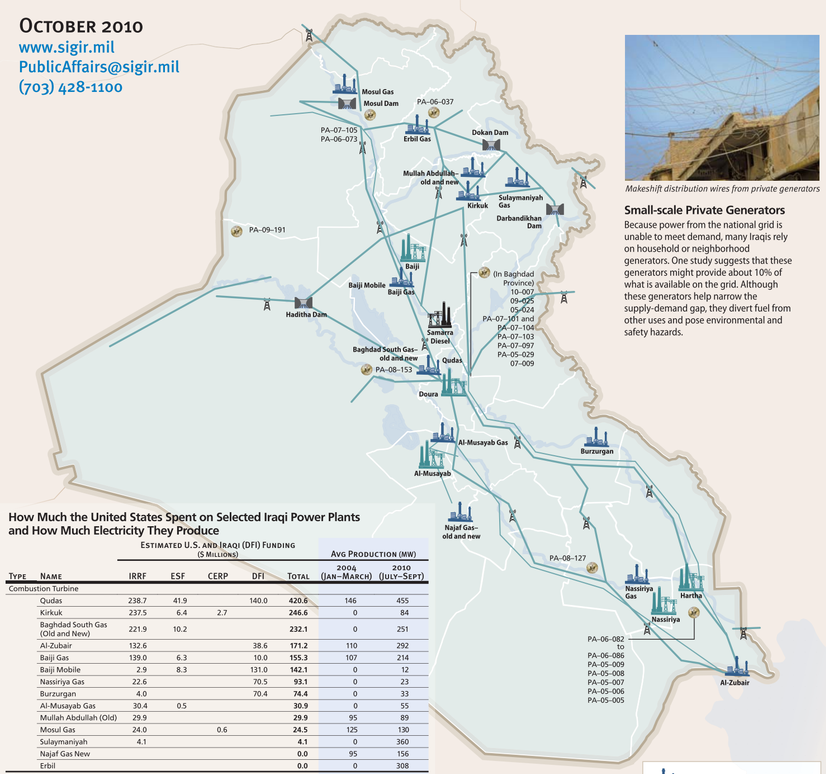
By 2002, Iraqi engineers were able to repair some of the existing plants and increase capacity to about 4,500 MW. However, the entire electricity infrastructure still suffered from the effects of war, lack of spare parts, and inadequate maintenance. And the people outside of Baghdad endured a system that allocated about 40% of the country's available power to the capital.

Damaged transmission tower, 2003

Makeshift distribution wires from private generators

Small-scale Private Generators

Because power from the national grid is unable to meet demand, many Iraqis rely on household or neighborhood generators. One study suggests that these generators might provide about 10% of what is available on the grid. Although these generators help narrow the supply-demand gap, they divert fuel from other uses and pose environmental and safety hazards.



How Much the United States Spent on Selected Iraqi Power Plants and How Much Electricity They Produce

Type	Name	Estimated U.S. and Iraqi (DFI) Funding ($ Millions) IRRF	ESF	CERP	DFI	Total	Avg Production (MW) 2004 (Jan–March)	2010 (July–Sept)
Combustion Turbine								
	Qudas	238.7	41.9		140.0	**420.6**	146	455
	Kirkuk	237.5	6.4	2.7		**246.6**	0	84
	Baghdad South Gas (Old and New)	221.9	10.2			**232.1**	0	251
	Al-Zubair	132.6			38.6	**171.2**	110	292
	Baiji Gas	139.0	6.3		10.0	**155.3**	107	214
	Baiji Mobile	2.9	8.3		131.0	**142.1**	0	12
	Nassiriya Gas	22.6			70.5	**93.1**	0	23
	Burzurgan	4.0			70.4	**74.4**	0	33
	Al-Musayab Gas	30.4	0.5			**30.9**	0	55
	Mullah Abdullah (Old)	29.9				**29.9**	95	89
	Mosul Gas	24.0		0.6		**24.5**	125	130
	Sulaymaniyah	4.1				**4.1**	0	360
	Najaf Gas New					**0.0**	95	156
	Erbil					**0.0**	0	308
Thermal								
	Doura	122.6	2.7	0.8		**126.2**	64	343
	Hartha	30.4		2.6		**33.0**	132	165
	Baiji	23.2				**23.2**	243	309
	Nassiriya	10.0				**10.0**	472	266
	Al-Musayab	7.6				**7.6**	502	687
Hydroelectric								
	Mosul Dam	36.8	8.6	0.2		**45.6**	626	254
	Haditha Dam	11.4		0.6		**12.1**	99	104
	Dokan Dam					**0.0**	NA	141
	Darbandikhan Dam					**0.0**	NA	117
Diesel								
	Samarra					**0.0**	0	140

PROFESSIONALISM PRODUCTIVITY PERSEVERANCE

For the sources of information used to create this insert, please see the last endnote in this October 2010 Quarterly Report.

2003 2004 2005 2006 2007 2008 2009 2010

GOI Ministry of Electricity

Minister:
Hussein al-Shahristani (acting)
Number of Employees:
Full-time: 74,247
Temporary: 8,044
Contracted: 20,390
Total: 102,681

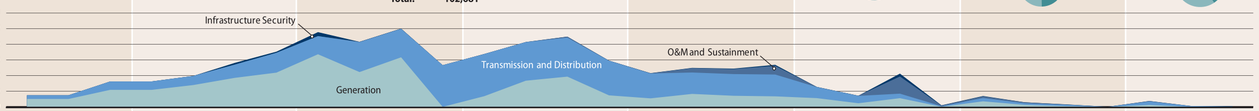
General Directorates:
Generation
Transmission
Distribution
Production Projects
Transmission Projects
Testing and Technical Workshops
Security

Ministry of Electricity Operating and Capital Budgets

$ Billions

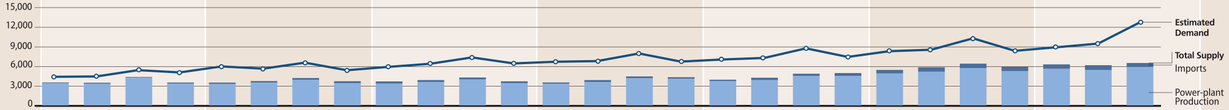
U.S. Electricity Expenditures, by Quarter

$5.0 Billion U.S. Funds, $1.1 Billion Iraqi (DFI) Funds



Average Iraqi Electricity Supply and Estimated Demand, by Quarter, 1/2004–9/2010

MW



Significant Events in the Electricity Sector

- Saboteurs and vandals damage power systems, causing frequent blackouts.
- USAID awards IRRF Phase I contract to Bechtel for reconstruction of vital infrastructure.
- Congress allocates $5.56 billion (later reduced to $4.32 billion) under IRRF 2 to rebuild electricity infrastructure.
- DoD awards IRRF 2 electricity program management contract to Parsons Joint Venture and design-build construction contracts to Perini, Washington Group, and Fluor/AMEC.

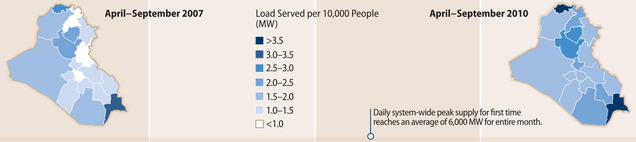
2003
- Coalition forces start bombing Iraq.
- Ambassador Bremer says the Coalition will raise Iraq's average daily electricity supply to 4,400 MW by October 2003.
- Bremer sets goal of achieving peak electricity supply of 6,000 MW by summer 2004.
- USACE forms Task Force Restore Iraqi Electricity to help meet 6,000 MW goal.

2004
- USAID awards $1.8 billion (later reduced to $1.2 billion) IRRF Phase II contract to Bechtel.
- Iraq starts importing electricity from Iran.

Transmission tower erected with IRRF funds

New combustion turbine transported to Kirkuk

Population-weighted Electricity Supply, by Province, 2007 vs. 2010



Daily system-wide peak supply for first time reaches an average of 6,000 MW for entire month.

2007
- *International Compact with Iraq* sets GOI goal of "meeting electricity demand at cost recovery tariffs with 10% reserve by 2015."

2008
- First privately built and operated power plant comes on line in Erbil.
- Monthly average supply begins to consistently stay above 4,400 MW.

2009
- Protests over electricity shortages erupt in Basrah, Nassiriya, and Ba'quba, resulting in two deaths and many injuries.

2010
- Electricity Minister Waheed resigns and is replaced by Oil Minister al-Shahristani.
- Estimated demand approaches 13,000 MW, resulting in record-high supply-demand gap.

Demonstrators in Basrah, June 2010 (AP photo)

Appliance store in Baghdad

Factors behind Rising Demand

- Increased availability and use of electrical appliances
- Construction of new buildings and infrastructure
- Economic growth
- Below-cost pricing and inadequate billing systems

Electricity Supply in Selected Countries, per 100,000 People

MWh/Day

Kuwait	United Arab Emirates	United States	Saudi Arabia	Iran	Turkey	Syria	Iraq	Pakistan	Afghanistan
4,663	**4,085**	**3,665**	**1,711**	**794**	**708**	**459**	**439**	**142**	**3**

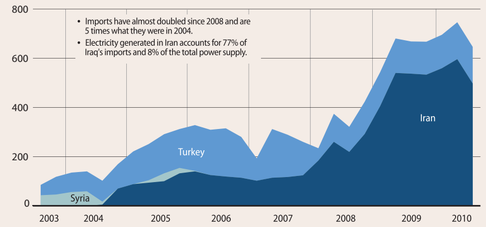
Top Electricity Contractors

$ Millions

Contractor Name	Total Costs	% of Total
Bechtel National, Inc.	1,149.09	22%
Washington Group International	458.46	9%
Fluor/AMEC, LLC	391.10	8%
Siemens	230.32	4%
IAP Worldwide Services	210.65	4%
Uruk/Baghdad JV	175.78	3%
Civilian Technologies Limited	134.04	3%
Perini Corporation	131.72	3%
Wamar International, Inc.	121.93	2%
Secure Global Engineering, LLC	115.02	2%

Electricity Imports, by Quarter, 2003–2010

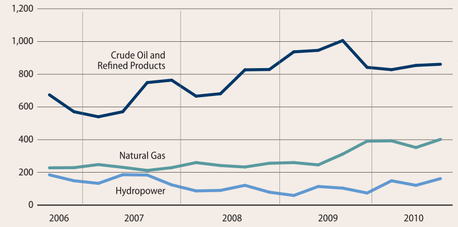
MW



- Imports have almost doubled since 2008 and are 5 times what they were in 2004.
- Electricity generated in Iran accounts for 77% of Iraq's imports and 8% of the total power supply.

Fuel Use in Iraq's Power Plants, by Quarter, 2006–2010

Billion British Thermal Units (or equivalent)



- Crude oil and refined fuel products currently account for more than 60% of the primary energy used to generate electricity.
- Natural gas use has increased about 70% over the past four years and now accounts for 56% of the fuel burned in combustion turbine plants.
- Hydroelectric plants—which depend on rainfall and competing demands for water—have not yet returned to their mid-2006 level of output.
- On average, 1,327 MW of power has been lost in 2010 because of fuel and water shortages.

Attacks on Electricity Infrastructure in 2010