

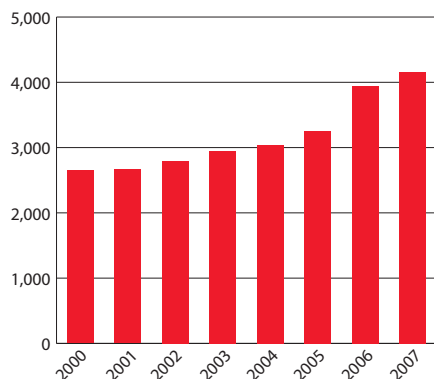
each account for 33 per cent of power demand. Industrial users make up 21 per cent, with most of the demand coming from the oil and gas sector and the Misurata steel complex, while agriculture accounts for 13 per cent. Demand is concentrated in the Tripoli, central and western regions of the country, reflecting the main urban centres on the Mediterranean coastline: together these three areas made up 71 per cent of total peak load in 2008. In contrast, the vast, but virtually uninhabited, southern region

Installed power capacity, 2008

Power station	Capacity (MW)	Contractor	Start of operations	Fuel
Tripoli West	325	Alstom	1976	Heavy fuel oil
Benghazi North steam	160	Deutsche Babcock	1979	Heavy fuel oil
Tripoli West	240	Bharat Heavy Electricals (BHEL)	1980	Heavy fuel oil; light fuel oil
Khoms steam	480	Deutsche Babcock	1982	Heavy fuel oil; light fuel oil; natural gas
Abukamash gas	45	Westinghouse	1982	Light fuel oil
Kufra gas	50	Fiat Avio	1982	Light fuel oil
Derna steam	130	BBC (ABB)	1985	Heavy fuel oil
Tobruk steam	130	BBC (ABB)	1985	Heavy fuel oil
Misurata steel	507	Hyundai Engineering & Construction	1990	Heavy fuel oil; natural gas
Sarir gas	45	Westinghouse	1990	Light fuel oil; natural gas
Tripoli South gas	500	ABB	1994	Light fuel oil
Zuweitina gas	200	ABB	1994	Light fuel oil; natural gas
Khoms gas	600	ABB	1995	Light fuel oil; natural gas
Western Mountain	624	BHEL	2005	Light fuel oil; natural gas
Benghazi North combined cycle	810	Daewoo Heavy Industries & Construction; ABB	2005	Light fuel oil; natural gas
Zawia combined cycle	1,350	Alstom; Hyundai Engineering & Construction; ABB	2005	Light fuel oil; natural gas
Total	6,196			

Source: Arab Union of Producers, Transporters & Distributors of Electricity

**Per capita consumption
2000-07 (kWh)**



Source: Gecol

The existing tariff system is broken down by sector and for residences by band, based on usage. The residence tariffs range from \$0.017 a kWh up to \$0.042 a kWh, which puts Libya on a par with most Gulf states.

Demand

In recent years, Gecol has had to face high rates of growth in demand for electricity, as a result of a population rising on average by 2.2 per cent a year and an economy expanding by 4 per cent a year in real terms. In the period 2000-08, peak power demand growth averaged 8-10 per cent a year reaching 4,756MW in 2008, up

The existing tariff structure, 2008

Type	\$/kWh
Residential (0-1,000kWh)	0.0167
Residential (1,001-1,400kWh)	0.0250
Residential (more than 1,400kWh)	0.0417
Small agricultural	0.0250
Heavy agricultural	0.0267
Light industry	0.0350
Heavy industry	0.0258
Commercial, street lighting	0.0566
Flat tariff	0.0362

Source: Gecol

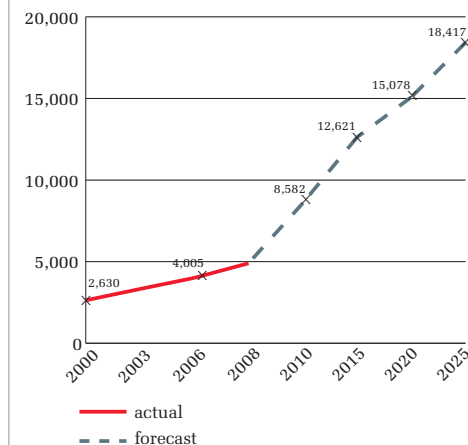
from 2,630MW in 2000.

Gecol forecasts that the rate of demand growth will accelerate in the coming years, due to increased investment, strong population growth and higher per capita consumption. In the period 2009-25, it estimates average annual growth will be 10-12 per cent with a spike anticipated in 2010. By 2020, it forecasts peak demand will hit 15,078MW and reach 18,417MW by 2025, almost four times higher than the actual 2008 figure.

The surge in peak demand is expected to be accompanied by a shift in the make-up of consumption. By 2015, Gecol estimates

↳ “Gecol forecasts that the rate of demand growth will accelerate in the coming years”

**Peak power demand
2000-25 (MW)**



Source: Gecol

that both the residential and industrial sectors will up their share of total consumption to 37 per cent and 29 per cent respectively, while agriculture will slump to 8 per cent of total demand and commercial users to 26 per cent.

The capacity building programme

To cover the demand, Gecol is preparing for a significant capacity building programme. It estimates that between 2009 and 2020 it will have to install 13,000MW of new generating capacity, double the amount currently installed.

Sources of water, 2008-11 (million g/d)		
Source	2008	2009-11
Great Manmade River	210	352
Groundwater	132	163
Desalination	31	75
Total	373	590

Source: General Desalination Company

the past 25 years on the first three phases of the GMR project.

The GMR delivered some 210 million g/d in 2008, a figure that is set to rise to 352 million g/d in the period 2009-11. The increase, along with a near doubling in desalination capacity, will result in total water production surging by an estimated 60 per cent to 590 million g/d.

Much of the additional GMR supplies are destined for the agricultural sector, which the government is looking to expand significantly. The decision to open up new tracts of arable land, along with a population growing by about 2 per cent a year, means that future water demand will be almost unlimited: as in the rest of the Middle East, whatever water that is available will be consumed.

Desalination

Responsibility for desalination is divided between the GDC

Installed desalination capacity, mid-2009		
Location	Capacity (million g/d)	Operation date
Gulf of Bomba	6.6	1990
Zliten	6.6	1992
Soussa	2.2	2000
Tobruk	8.8	2002
Abutaraba	8.8	2006
Zwara	8.8	2006
Total	41.9	

Source: General Desalination Company

and Gecol. Gecol's new role is now now confined to desalination units which are part of cogeneration plants, leaving GDC responsible for standalone facilities.

Libya's first experience of desalination dates back to the 1960s when it built small plants to treat brackish water to serve local communities. A decade later, it began to implement larger units as part of cogeneration plants. However, compared to the Gulf desalination sector, plant capacities remained small, reflecting Tripoli's focus on the GMR project to meet the bulk of its future water supplies and its tendency to go for multi-effect distillation (MED) technology.

As of mid-2009, GDC had installed capacity of 42 million g/d of water. In addition, Gecol had about 20 million g/d. Among regional oil-rich states, Libya is

one of the smallest desalination producers. By comparison, Saudi Arabia's current installed capacity is estimated at 850 million g/d, Abu Dhabi's at 645 million g/d and Oman's at 140 million g/d.

Libya has taken most units built before 1990 out of service. As a result, its main desalination plants are located at Abutaraba, the Gulf of Bomba, Soussa, Tobruk, Zliten and Zwara.

Capacity building programme

Despite the modest size of its desalination sector, Libya has drawn up a programme to massively increase desalination capacity to meet rising demand in coastal, urban centres. By 2015, GDC is planning to hike desalination capacity to 515 million g/d, a 10-fold increase on mid-2009 capacity. The cost of the programme is estimated at \$2.2bn.

By mid-2010, four new desalination plants will be brought on stream providing additional capacity of 44.1 million g/d. Located at Derna, Soussa, Zawia and Zwara, all four plants are being built by France's Sidem and will use MED technology.

Both the Derna and Soussa plants were due to be fully commissioned in October 2009. At Zawia, the largest of the four, first water is expected before the end

→ **“Responsibility for desalination is divided between GDC and Gecol”**