



# **Annual Gas Production and Consumption**

**2011-2012**

**Hydrocarbon Unit**

**Energy and Mineral Resources Division**

**Ministry of Power, Energy and Mineral Resources**

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## Table of Contents

1.0	Background .....	1
2.0	Summary .....	2
3.0	Gas Production .....	4
3.1	National Companies .....	4
3.1.1	Bangladesh Petroleum Exploration and Propduction Co. Ltd .....	4
3.1.1.1	Fenchuganj Gas Field .....	5
3.1.1.2	Salda Nadi Gas Field .....	5
3.1.1.3	Shahbazpur Gas Field .....	5
3.1.1.4	Semutang Gas Field .....	5
3.1.1.5	Sundalpur Gas Field .....	5
3.1.2	Bangladesh Gas Fields Co. Ltd .....	5
3.1.2.1	Titas Gas Field .....	6
3.1.2.2	Habiganj Gas Field .....	6
3.1.2.3	Bakhrabad Gas Field .....	6
3.1.2.4	Narshingdi Gas Field .....	6
3.1.2.5	Meghna Gas Field .....	6
3.1.3	Sylhet Gas Fields Co, Ltd .....	6
3.1.3.1	Kailas Tila Gas Fields Ltd .....	7
3.1.3.2	Rashidpur Gas Field .....	7
3.1.3.3	Beani Bazaar Gas Fields .....	7
3.1.3.4	Sylhet Gas Fields .....	7
3.2	International E and P Companies .....	7
3.2.1	Chevron .....	8
3.2.1.1	Bibiyana Gas Field .....	8
3.2.1.2	Jalalabad Gas Field .....	8
3.2.1.3	Moulavi Bazar Gas Field .....	9
3.2.2	Tullow Oil .....	9
3.2.2.1	Bangura Gas Field .....	9
3.2.3	Santos .....	9
3.2.3.1	Sangu gas Field .....	9
4.0	Gas Production, Supply and Consumption .....	9

## List of Figures

Figure 1	Field Wise Annual Gas Production in MMcfd, 1960-61 – 2011-12	10
Figure 2	Well Wise Annual Gas Production in MMcfd, July 2011 – 30 June 2012	10
Figure 3	Field Wise Gas Production in MMcfd, July 2011 – June 2012	11
Figure 4A	Comparison of Field Wise Daily Gas Production in MMcfd, 1 July 2011- 30 June 2012 All Producing Gas Fields	11
Figure 4B	Comparison of Field Wise Daily Gas Production in MMcfd, 1 July 2011- 30 June 2012 Fields Producing Less Than 80 Mcfd	12
Figure 5	Contribution in Gas Production Rate in MMcfd by the National Companies and IOCs. 2011-12	12
Figure 6	Company Wise Gas Production in MMcfd & Bscf, 2011-12	13
Figure 7	Field Wise Gas Production in Bscf	13
Figure 8	Field Wise Condensate Production in bbl/day	14
Figure 9	Comparison of Field Wise Annual Gas Production in MMcfd, 2011-12	14
Figure 10	Field Wise Condensate Production in bbl/day, 2011-12	15
Figure 11	Recovery of Finished Petroleum Product in 1000 bbl, 2011-12	15
Figure 12	Well Wise Daily Gas Production in MMcfd, All Producing Gas Wells Under National Companies, 2011-12	16
Figure 13	Field Wise Gas Production by National Companies in MMcfd, 1 July 2011 – 30 June 2012	16
Figure 14	Comparison of Annual Gas Production by National Companies in MMcfd and Bscf, 2011-12	17
Figure 15	Field Wise Annual Gas Production of all Producing Gas Fields of National Companies, 2011-12	17
Figure 16	Field Wise Annual Gas Production in MMcfd, All Producing Wells of BAPEX, 2011-12	18
Figure 17	Share in Gas Production in MMcfd and Bscf, Gas Fields Operated by BAPEX, 2011-12	18
Figure 18	Field Wise Gas Production in MMcfd, All Fields of BGFCL, 2011-12	19
Figure 19	Field Wise Gas Production in MMcfd and Bscf, BGFCL 2011-12	19
Figure 20	Field Wise Annual Gas Production in MMcfd, All Producing Gas Fields under SGFL, 2011-12	20
Figure 21	Field Wise Production in MMcfd and Bscf, SGFL, 2011-12	20
Figure 22	Well Wise Daily Gas Production in MMcfd by IOCs. 2011-12	21
Figure 23	Field Wise Gas Production in MMcfd by IOCs	21
Figure 24	Field Wise Gas Production in MMcfd/Bscf, IOC Operated Gas Fields, 2011-12	22
Figure 25	Company Wise Annual Gas Production in MMcfd and Bscf, International Oil Companies, 2011-12	22
Figure 26	Field Wise Gas Production in MMcfd, Chevron Operated Gas Fields, 2011-12	23
Figure 27	Field Wise Annual Gas Production in MMcfd & Bscf, Chevron, 2011-12	23
Figure 28	Well Wise Gas Production in MMcfd, Tullow Oil, 2011-12	24
Figure 29	Well Wise Gas Production in MMcfd, Santos, 2011-12	24
Figure 30	Sector Wise Gas Consumption in MMcfd and Bscf, 2011-12	25
Figure 31	Sector Wise Monthly Gas Sales in MMcfd by Distribution Companies, 2011-12	25
Figure 32	Gas Production in Bscf, Gas Purchase and Sales in Bscf by Distribution Companies, 2011-12	26

## 1.0 Background

First exploration in Bangladesh is recorded at the beginning of 1908. It was BOC (Burmah Oil Co). BOC conducted surface geological mapping in Chittagong area. During 1910 to 1914 exploratory wells were drilled in Sitakund and presence gas was recorded. These wells were drilled by BOC and IPPC (Indian Petroleum Prospecting Co.) Due to First World War exploration activities ceased. After the 1<sup>st</sup> World exploration activities resumed and during 1923-33 two wells were drilled by BOC in Patharia structure in Baralekha. Bazar. Both the wells had oil and gas shows.

After the 2<sup>nd</sup> WW due to political reason exploration activity remained suspended. However after end of World War II, due to political reason exploration activity remained suspended.

After Independence of India and Pakistan in 1947, exploration activities resumed in 1951. Pakistan Petroleum Ltd. (PPL), a subsidiary of Burmah Oil Company (BOC), started exploration in greater Sylhet area. This resulted in first discovery of gas in Sylhet (1951-55). Four years later in 1959 gas was discovered in Chattack. PPL was the operator for of these two gas fields.

Pakistan Shell Oil Co. (PSOC), a subsidiary of Shell Oil started exploration and discovered gas in Rashidpur (1960), Titas (1962), Kailas Tila (1962) and Habiganj (1963).

Gas Production in this part of the world started in 1960-61 fiscal year when Sylhet and Chattack, both the gas fields were open for production. Production from Titas and Habiganj gas fields started in 1968.

State participation in petroleum exploration started in 1960 when Oil & Gas Development Corporation was created with technical assistance from former Soviet Union. Semutang Gas Field was discovered in 1970-71.

After independence of Bangladesh, technical assistance from former USSR (former) reestablished and exploration activity picked up momentum. Begumganj, Feni, Kamta gas fields were discovered during this period. Offshore area of the country was awarded to international companies. During last decades new gas discoveries were made by both national and international companies. Updated estimate placed GIIP at 35.5 Tscf and reserve at 28.2 Tscf (Updated Report on Gas Reserve Estimation 2010, Gustavson Associates LLC, USA).

After independence offshore area was considered for exploration. Six E&P companies were selected and these companies drilled several wells resulting in a small gas discovery. During second phase of offshore exploration resulted in discovery of a small gas pool. It was developed within a short time. However after operating for several years' production decline was

observed. Due to low production rate, recently this field was shut down by the operator. Petrobangla is preparing for another off shore exploration bid round.

## **2.0. Summary**

Annual gas production report is based on gas and condensate production data received from gas production companies. Information on gas sales and purchase by the producers and distributors is collected from MIS report of Petrobangla.

In 2011-12 fiscal year total gas production logged 749.1 Bscf, which equals to 2045 MMcfd. In the immediate past fiscal year gas production logged 708 Bscf, which is equal to 1940 MMcfd. Annual increase in gas production was 5.6 percent or 120.5 MMcfd (44Bscf). Total production since inception logged 10.6 Tscf.

During the year well wise minimum production was recorded at 0.75 MMcfd from E Sand of Bangura well 2. Maximum production was recorded at 89.1 MMcfd, from Bibiyana well 2.

In 2011-12 fiscal year national companies produced at an average rate of 970.9 MMcfd and annual production was 354.4 Bscf. International oil companies produced 394.1 Bscf and average daily production was 1079.7 MMcfd.

Bibiyana gas field topped the list by producing at an average rate of 743.5 MMcfd and annual production was 271.4 Bscf. Second position was taken by Titas Gas field, which produced at an average rate of 440.9 MMcfd and total annual production was 91.1 Bscf. Habiganj gas field occupied third position by producing at the rate of 249.7 MMcfd. Total production of Habiganj gas field during the year was 91.1 Bscf.

Company wise maximum production was recorded from Chevron. During the year the company produced 356.4 Bscf gas and average daily production was 976.3 MMcfd. BGFCL is the second largest producer of gas and in 2011-12 this company produced at an average rate of 763.1 MMcfd and total production during the year was 278.5 Bscf.

Four gas fields i.e. Bibiyana, Jalalabad, Titas and Habiganj produced 78.4 percent of total gas produced during the year. Last year share of these four companies was 79 percent of total production.

Figure 1 shows field wise annual gas production in MMcfd since 1961. During the current year (2011-12) gas production continuously increased. In the month of July gas production was close to 2000 MMcfd. During the year production gradually increased and at the end of the year it crossed 2100 MMcfd mark. This can be seen in figure 2 and 3. Figure 2 shows well wise annual

gas production in MMcfd. Figure 3 is prepared using field wise gas production data in MMcfd. Company wise summarized annual gas production in Bscf can be seen in next page.

FY	SGFL	BGFCL	BAPX	Chevron	Tullow	Santos	Total
2010-11	55.8	269	13.2	323	41	6.5	708
2011-12	55.4	278.5	21.1	353.6	36.9	3.9	749

Well wise annual gas production in MMcfd for the year can be seen in figure 2. Field wise annual gas production in MMcfd can be seen in figure 3. In both the figures affect of Eid holidays is quite prominent. Field wise comparison of gas production in MMcfd can be observed in figure 4a. Figure 4b high lights gas fields producing less than 80 MMcfd. Comparison of gas production in MMcfd by IOCs and national companies is highlighted in Figure 5. Figure 6 shows company wise gas production in MMcfd and Bscf.

Effect of two Eid holidays is quite prominent in both the figures i.e. well wise and field wise gas production figures (Figure 2 and 3). However in this year production of national companies is not that effected during these holidays.

Figure 4a shows daily field wise gas production in MMcfd in line graph. For convenience, fields producing below 80 MMcfd is shown separately as figure 4b. Figure 5 compares annual production in MMcfd between IOC and National companies.

Company wise share in gas production is shown as figure 6. During the year Chevron produced 356 Bscf gas. BGFCL produced 280 Bscf gas. Field wise gas production of all fields is graphically presented as figure 7.

During the reported year 2,368,518 bbl condensate was recovered. Average daily recovery rate was 6,489 bbl/day. Bibiyana gas field produced 1160 thousand bbl and average daily production was 3177 bbl/day. Jalalabad gas field produced at a rate of 1410 bbl/day. Kailas Tila gas field produced condensate at an average rate of 761 bbl. These three gas fields are the top three liquid producers. Figure 8 shows daily Field wise condensate production in 1000 bbl.

bbl	2010-11	2011-12
MS	437,339	471,2,93
HSD	412,705	409,762
NGL	196,377	212,535
Condensate	2,334,684	2,382,057

Kerosene	140,698	139,880
Octane	40,734	16,218

Data Source: MIS Report, June 2012, Petrobangla

In addition to condensate, finished product i.e. MS, HSD, NGL, octane and kerosene were recovered during the year. Liquid product recovered during 2011-12 is provided in the table in previous page.

Comparison of field wise gas production in MMcfd can be seen as figure 9. Similarly field wise comparison of condensate production can be observed in figure 10. It can be seen that in both the cases Bibiyana gas field topped the list. Category wise recovery of finished product can be seen in Figure 11

According to MIS report during the year gas production was 21056 MMCM (743.6 Bscf) and consumption was 21356 MMCM (754.2 Bscf).

### **3.0. Gas Production**

#### **3.1. National Companies:**

During the year BAPEX, BGFCL, SGFL all three national companies continued production without any interruption. During the year national companies produced 354.3 Bscf gas and average daily production was 971 MMcfd. During the year minimum daily production was recorded at 489 MMcfd and maximum daily production was 1197 MMcfd. During the year share of national companies in total gas production was 47.1 percent. During the year daily condensate recovery by the national companies logged 1569 bbl/day. Annual condensate production logged 572,751 bbl. Figure 12 shows well wise daily gas production in MMcfd. Figure 13 is based on field wise gas production in MMcfd. Company wise (national Co) share in gas production in MMcfd is provided as figure 14. Field wise gas production of national gas fields can be seen in figure 15.

#### **3.1.1. Bangladesh Petroleum Exploration & Production Company (BAPEX)**

BAPEX is the lone E and P Company under government ownership. During the year the company operates five gas fields and those are Salda Nadi, Fenchuganj, Shahbazpur, Semutang and Sundalpur. Sundalpur is a recent gas discovery by BAPEX. Salda Nadi and Fenchuganj gas fields remained flowing during the entire period. Shahbazpur gas field remained shut down from 9<sup>th</sup> April to 18<sup>th</sup> July. Semutang gas field was open for production on 5<sup>th</sup> December 2011. Semutang gas field was discovered in the year 1970-71 by Oil and Gas Development Corporation (OGDC). After independence of Bangladesh, Shell Oil was awarded some area in Chittagong and Chittagong Hill Tract including Semutang gas field. Shell drilled 5<sup>th</sup> well in Semutang. Gas was found in Semutang well 5. However Shell relinquished entire area and left

country. BAPEX was awarded Semutang gas field and the company completed the well as a gas producer. Production from this field started from 5<sup>th</sup> December 2011. Figure 16 shows field wise gas production in MMcfd. Field wise contribution in production in MMcfd is provided as figure 17.

Sundalpur discovery was brought into production on 17 March, 2012.

In 2011-12 fiscal year BAPEX produced 20.5 Bscf gas and average daily production was 56.1 MMcfd. During the year the company recovered 15.1 thousand bbl condensate.

**3.1.1.1. Fenchuganj Gas Field** is the main gas producer of BAPEX. During the year this field produced at an average rate of 28.3 MMcfd and total production during the year logged 10.4 Bscf. During the year 6.4 thousand bbl condensate was recovered. Average daily recovery rate was 17.6 bbl. Condensate recovery rate was 0.62 bbl/MMcf.

**3.1.1.2. Salda Nadi Gas Field** was the 2nd gas discovery by BAPEX. First well was completed as a dual producer one. Later well 3 was also completed as dual producer. During the year 6.5 Bscf gas was produced from this field. Average daily production was 17.9 MMcfd. During the year 4.5 thousand bbl condensate was recovered. Average condensate recovery rate was 12.3 bbl per day.

**3.1.1.3. Shahbazpur Gas Field** was discovered by BAPEX. During the year this field produced 0.65 Bscf gas and average daily production was 1.8 MMcfd. This gas field remained shut down from July to March during this year. Production resumed from April 2012.

**3.1.1.4. Semutang Gas Field** was open for production on 1 December 2011. Production rate was 14 MMcfd at the beginning and it gradually reduced to 10 MMcfd at the end of the year. Total annual production was 2.6 Bscf and average daily production was 6.8 MMcfd.

**3.1.1.5. Sundalpur Gas Field** is a new discovery by BAPEX. This field was brought under production on at a record time (16 March). During this production period (3 ½ months) this field was flowing at a average rate was 8.3 MMcfd. Total production in the year was 0.88 Bscf. Condensate production rate for the production period was 8.4 bbl/day and total recovery was 896 bbl. Condensate extraction was 1.02 bb/ MMcf gas.

### **3.1.2. Bangladesh Gas Fields Co. Ltd. (BGFCL):**

This company is the largest gas producer among the national companies and second largest gas producer of the country. BGFCL operates five gas fields i.e. Titas, Habiganj, Bakhrabad, Narshingdi and Meghna gas fields. During the year the company produced 278.5 Bscf gas and

average daily production rate was 763.1 MMcfd. Production was quite uniform except for the first week in September when production was slightly reduced due to Eid Holidays.

During the year maximum gas production was recorded at 779.12 MMcfd and the minimum production was 642.0 MMcfd. During the year condensate production logged 168.5 thousand bbl and average daily recovery rate was 461.7 bbl/day.

Figure 18 shows field wise gas production in MMcfd and Fig 19 shows field wise share in gas production (MMcfd/Bscf).

**3.1.2.1. Titas gas field** is the largest gas producer among the national companies and the second largest gas producer of the country. In terms of gas reserve Titas is the largest of the country. During the year Titas gas field produced 160.9 Bscf gas and average daily production was 439.7 MMcfd. 140.9 thousand bbl condensate was recoverable along with gas. . Average daily recovery rate of condensate was 385.9 bbl. Gas is quite dry and condensate recovery rate was 0.88 bbl/MMcf gas. During the year gas production slowly increased to 450 MMcfd from 421 MMcfd.

**3.1.2.2. Habiganj gas field** is the third largest gas field of the country. During the year 91.1 Bscf gas was produced at an average rate of 249.1 MMcfd. Habiganj gas is quite dry and average condensate recovery rate is 0.052 bbl/ MMcf gas. During the year 4754 bbl condensate was recovered. During the year gas production gradually reduced to 233 MMcfd from 260 MMcfd.

**3.1.2.3. Bakhrabad gas field** produced at an average rate of 32.7 MMcfd. Total production was 11.9 Bscf. Condensate recovery rate was 0.88 bbl/MMcf gas. During the year total recovery was 5180 bbl. During the year gas production gradually reduced to 31.6 MMcfd from 33.2 MMcfd.

**3.1.2.4. Narshingdi gas field** produced at an average rate of 29.7 MMcfd. Total production was 10.8 Bscf. Production rate was fairly uniform during the year. Condensate production logged 10,667 bbl. Average recovery rate was 29.2 BCPD. Condensate recovery rate was 0.98 bbl/MMcf gas.

**3.1.2.5. Meghna gas field** produced 3.7 Bscf gas at an average rate of 10.1 MMcfd. Gas production rate was quite uniform. Condensate recovery logged 7035 bbl and recovery rate was 1.9 bbl/MMcf gas.

### **3.1.3. Sylhet Gas Fields Ltd (SGFL):**

This is the oldest gas producing company of the country. Pakistan Petroleum Ltd (PPL), a subsidiary of Burmah Oil of UK (not existing) was the operator of for two gas fields i.e. Chattack

and Sylhet. After independence the operators (PPL) did not return to the country. Government took over the responsibility and arrangement was made to operate these two gas fields. Subsequently Sylhet Gas fields Co Ltd (SGFL) was created. Later on SGFL was awarded with another two gas fields i.e. Kailas Tila and Rashidpur, both discovered by Shell. Another gas field Beani Bazar, discovered by Petrobangla was also awarded to SGFL. Figure 20 shows field wise daily gas production in MMcfd. Pie graph (Fig 21) shows field wise share in gas production in MMcfd.

During the year 2011-12 the company produced 55.4 Bscf gas and average daily production was 151.7 MMcfd. During the same period 389.3 thousand bbl was recovered. Daily condensate recovery rate was 1066.7 bbl per day.

**3.1.3.1. Kailas Tila gas field** is the main producer of the company. During the year this field produced 30.3 Bscf gas and average daily gas production was 83.1 MMcfd. During the same period 277.7 thousand condensate was recovered. Average daily condensate recovery rate was 761 bbl/day. Liquid recovery rate was 9.16 bbl/MMcf gas. Condensate recovery logged 27779 bbl. Average daily recovery was 790.9 bbl/day. Condensate yield rate was 9.16 bbl/MMcf of gas. In addition to condensate MS, HSD and NGL is recovered from gas.

**3.1.3.2. Rashidpur gas field** produced 17.3 Bscf gas in 2011-12 fiscal year. Average daily gas production was 47.3 MMcfd. Maximum gas production rate was recorded at 50.1 MMcfd and minimum production was 22.5 MMcfd. Gas production rate was quite uniform during the year. 16.6 thousand bbl condensate was recovered during the year. Condensate recovery rate was 0.96 bbl/ MMcf of gas.

**3.1.3.3. Beani Bazar Gas Field** produced 4.1 Bscf of gas and average daily production rate was 11.2 MMcfd. At the beginning daily gas production was about 9-10 MMcfd which gradually increased to 12-13 MMcfd. During the year 2.56 thousand bbl condensate was recovered. Average recovery rate was 16.34 bbl/ MMcfd of gas.

**3.1.3.4. Sylhet (Haripur) Gas Field** is the oldest producing gas field of the country. During the year 3.7 Bscf gas was produced and average daily production was 10.13 MMcfd. At the end of February gas production went down to just over 2 MMcfd. This production rate continued for a week. 28.1 thousand bbl condensate was recovered during the year. Average daily condensate recovery was 77.1bbl. Condensate recovery rate was 7.59 bbl/MMcf gas.

## **3.2. International E &P Companies**

In 2011-12 fiscal year Chevron, Tallow and Santos these three international E and P companies remain active in gas production. Chevron was also involved in field development activities.

During the year these three companies produced 397.2 Bscf gas and average production rate was 1088.3 MMcfd. During the year 1796 thousand bbl condensate was recovered by three the PSC operators. Average daily condensate production rate was 4920 bbl/day.

Well wise daily gas production in MMcfd by IOC operated gas wells can be seen in Figure 22. It also shows that that during the year gas production by IOCs increased by about 100 MMcfd. Figure 23 shows field wise gas production in MMcfd of IOC operated gas fields. Field wise gas production of IOC operated gas fields can be seen in figure 24. Figure 25 shows company wise share in gas production in MMcfd of three IOCs.

### **3.2.1. Chevron:**

Chevron operates three gas fields i.e. Bibiyana, Jalalabad and Moulavi Bazar gas fields. Bibiyana and Moulavi Bazar gas fields were discovered by Chevron (UNOCAL). Jalalabad gas field was discovered by Scimitar Oil. Later this field was awarded to Chevron for development and production. During the year Chevron produced 357.2 Bscf gas and average daily production was 976.3 MMcfd. During the same period 1677.4 thousand bbl condensate was recovered. During the year maximum production was recorded at 1082.9 MMcfd and minimum production rate was 404.2 MMcfd.

Figure 26 shows daily gas production in MMcfd of three gas fields operated by Chevron. This figure shows gradual increase in production from about 950 MMcfd to 1050 MMcfd. Field wise share in gas production can be seen in figure 27. This also shows that about three quarter of Chevron's production comes from Bibiyana gas field.

**3.2.1.1. Bibiyana** is the main gas producer of Chevron as well the country. During the year this gas field produced at an average rate of 743.5 MMcfd and total production was 271.4 Bscf. During two Eid holidays daily production was significantly cut back (fig 26, Fig 4a). Production from this field went below 400 MMcfd during Eid holidays. During the year minimum production was 105 MMcfd and maximum production was 799.4 MMcfd. 1160 thousand bbl condensate was recovered from Bibiyana gas field. Condensate recovery rate was 4.27 bbl/MMcf gas.

**3.2.1.2. Jalalabad** gas field is the second largest gas field under Chevron. During the year average daily gas production was 180.4 MMcfd. During the year Jalalabad field produced 63.1 Bscf gas. At the beginning production rate was 172.4 MMcfd and it gradually increased to 244.4 MMcfd. During the year 514.7 bbl condensate was recovered. Average daily recovery rate was 1410 bbl/day. Condensate recovery rate was 7.82 bbl/ MMcf gas.

**3.2.1.3. Moulavi Bazar** gas field produced 19.1 Bscf gas and average daily production was 52.3 MMcfd. Gas flow rate was fairly uniform during the year. 3.2 thousand bbl condensate was recovered during the reporting period. Condensate recovery rate was 0.17 bbl/MMcf gas. Daily average recovery of condensate was 8.8 bbl.

### **3.2.2. Tullow Oil**

**3.2.2.1. Bangura** gas field is operated by Tullow Oil. During the year 36.9 Bscf gas was produced. This equals to average daily production of 101 MMcfd. During the year 117.7 thousand bbl condensate was recovered. Condensate recovery rate was 3.19 bbl/MMcf gas. Figure 28 shows well wise daily gas production in MMcfd.

### **3.2.3. Santos**

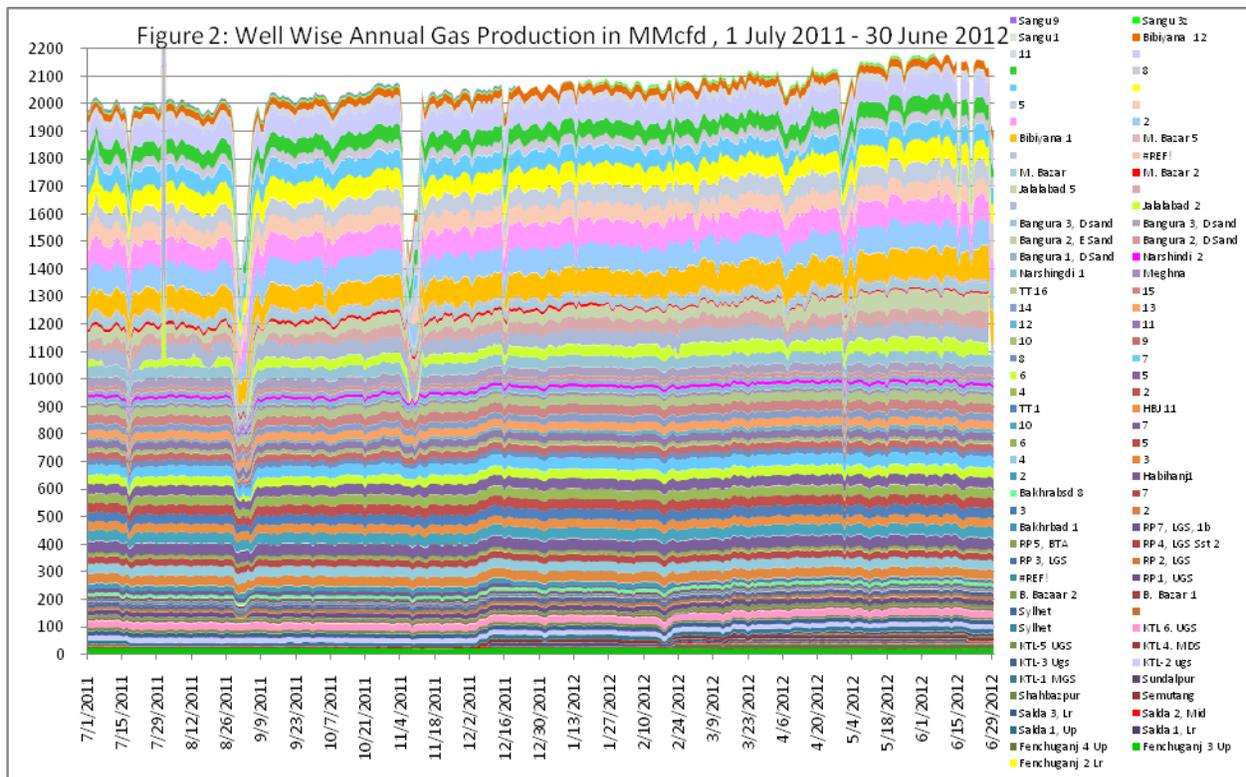
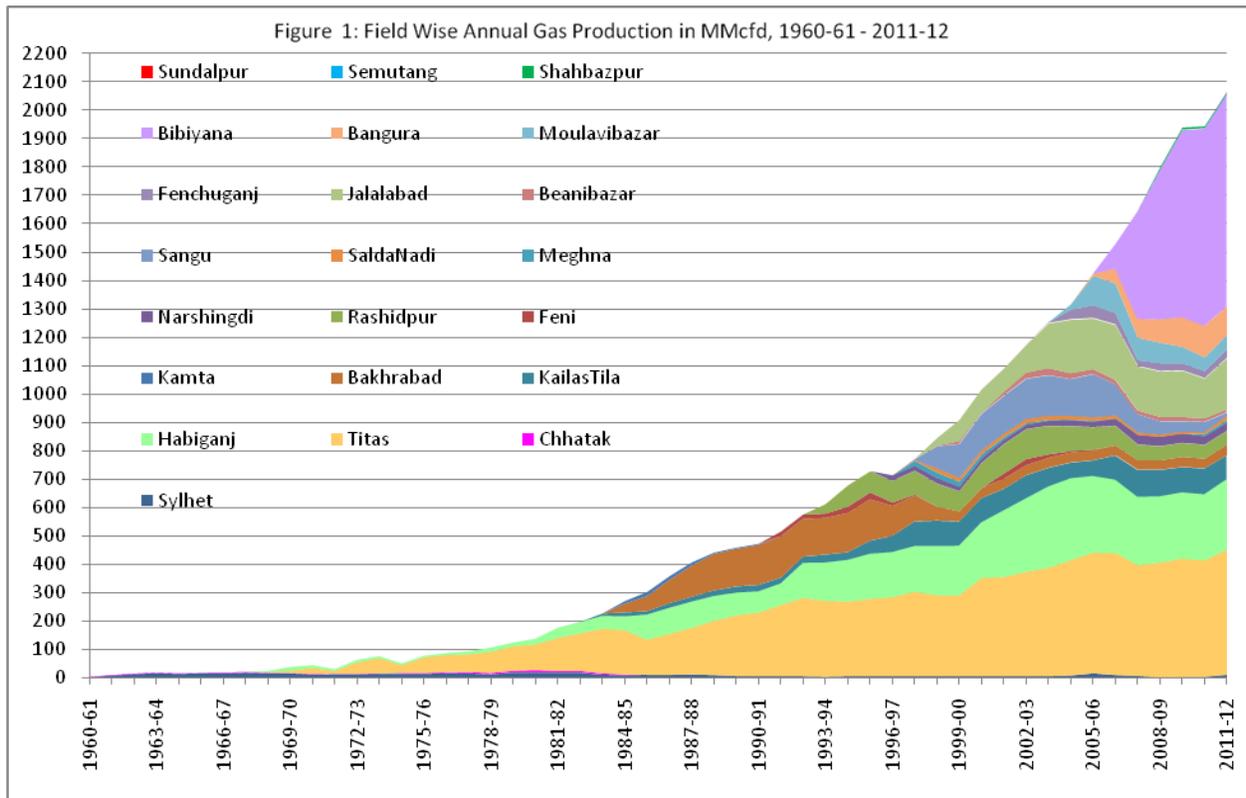
**3.2.3.1. Sangu** gas field was the lone offshore gas field of the country. This gas field was discovered by Cairn Energy. Cairn Energy developed the gas field and started producing gas. However production started to decline within a short period. Cairn left the country. Santos, an Australian comp[any took over the over the operation and tried to increase production. It was a short term operation and the company decided to left the country. During the year 3.97 Bscf gas was produced and average daily production was 10.9 MMcfd. Daily production ranged from 15 MMcfd to 3 MMcfd. During the middle of the year there was no production for several days. During the year 0.67 thousand bbl condensate was recovered. Average daily recovery was 1.8 bbl per day. The company decided to terminate production from Sangu gas field. Figure 29 shows well wise daily gas production in MMcfd as well as production decline.

## **4.0 Gas Production, Supply and Consumption:**

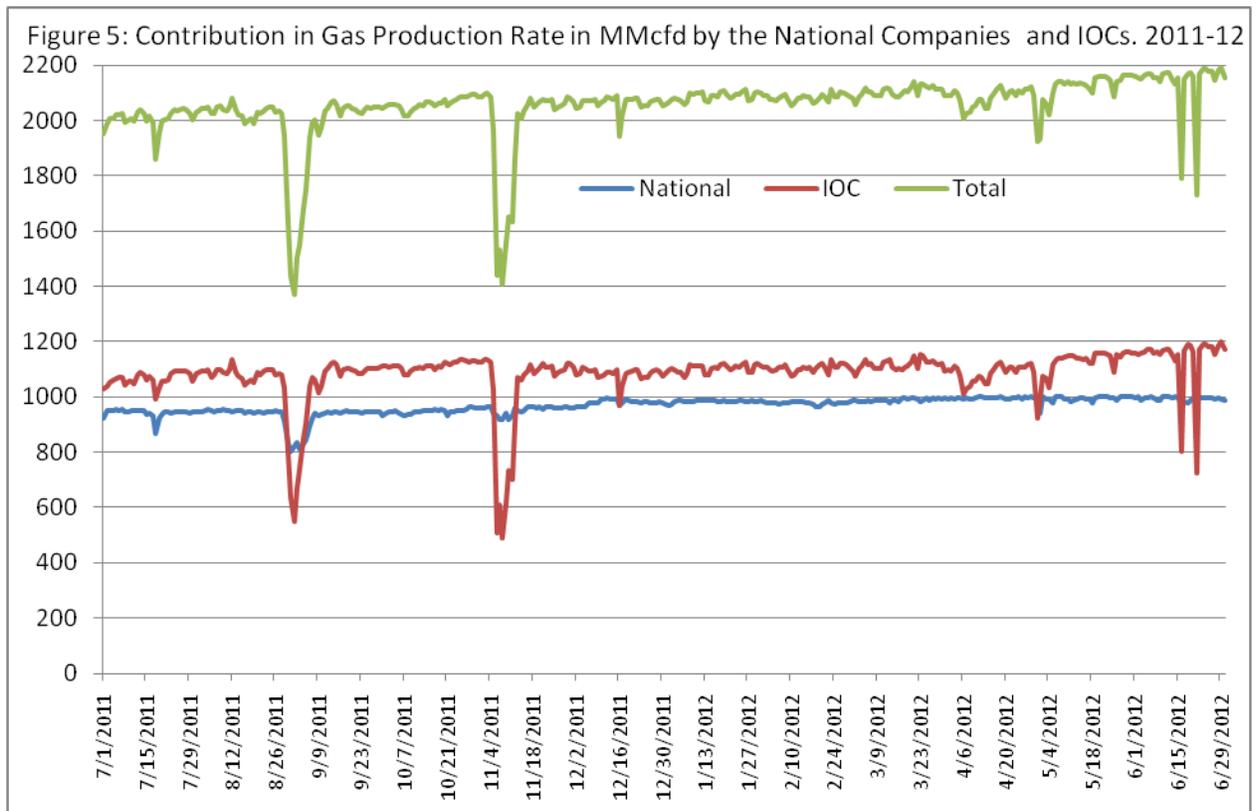
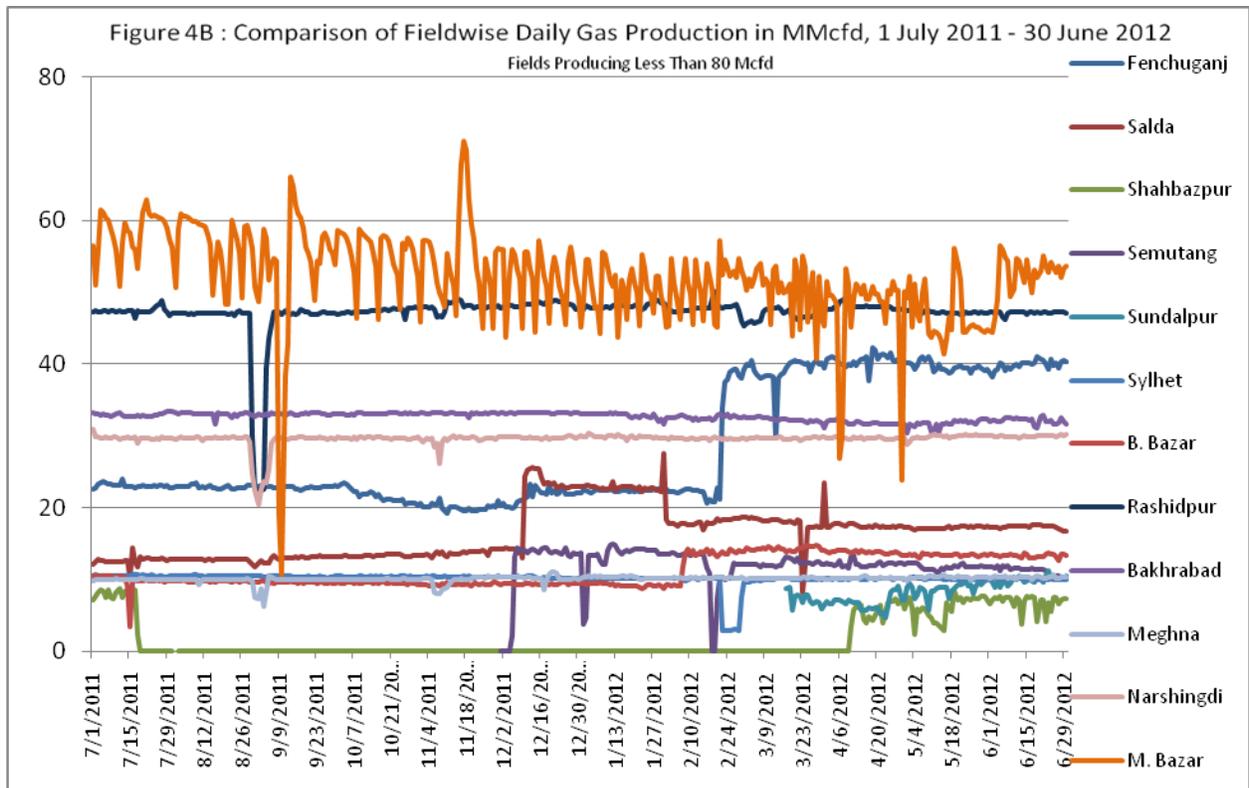
According to daily gas production data provided by the gas production companies total gas production in 2011-12 was 748.5 Bscf. According to MIS report (June 2012) total production was 743.6 Bscf. Gas purchase by the gas distribution company logged 741.5 Bscf. Gas production companies consume some gas to run production facilities and other utilities. As a result total produced volume of gas is not available for sale.

According to MIS report gas sales by the distribution companies logged 754.2 Bscf. This figure is 10 Bscf more than total production.

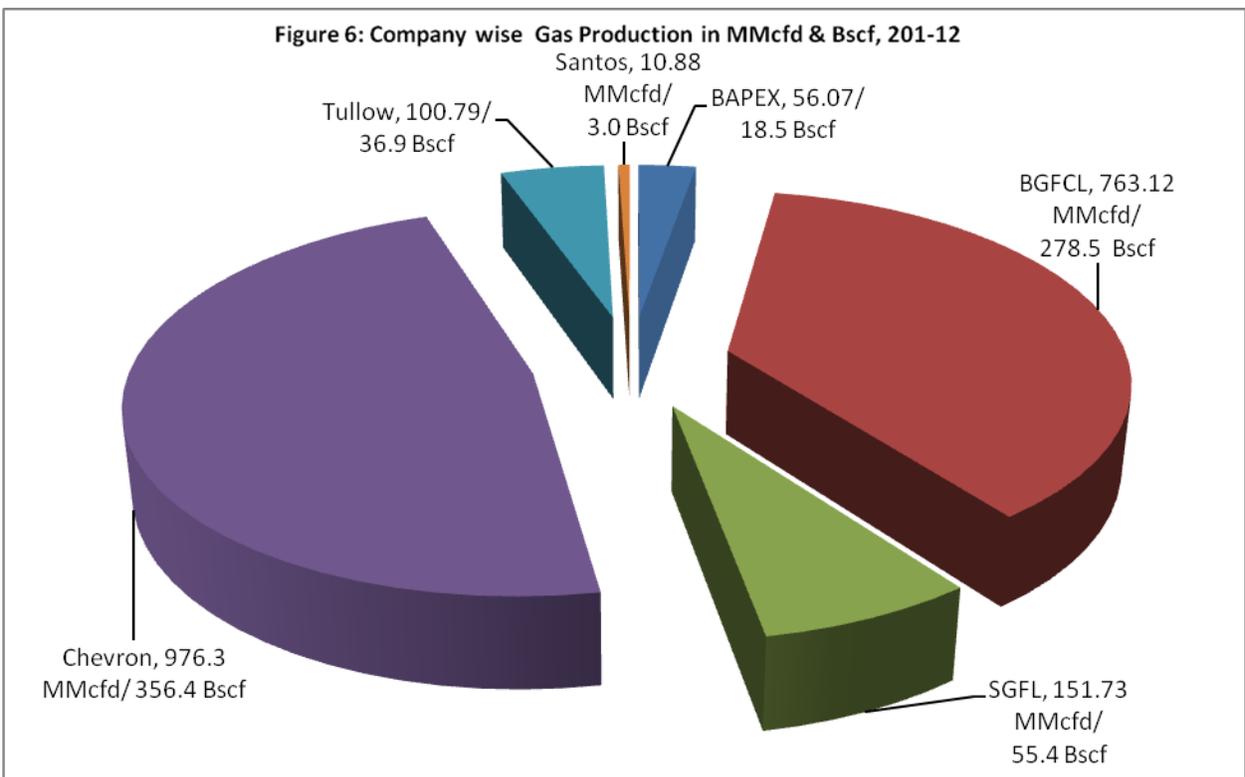
According to MIS report 428 Bscf gas was consumed by Power sector, which is the major consumer of gas. Figure 30 shows sector wise gas consumption in Bscf and MMcfd. Industry sector consumed 128 Bscf gas. 89 Bscf gas was consumed by domestic sector.



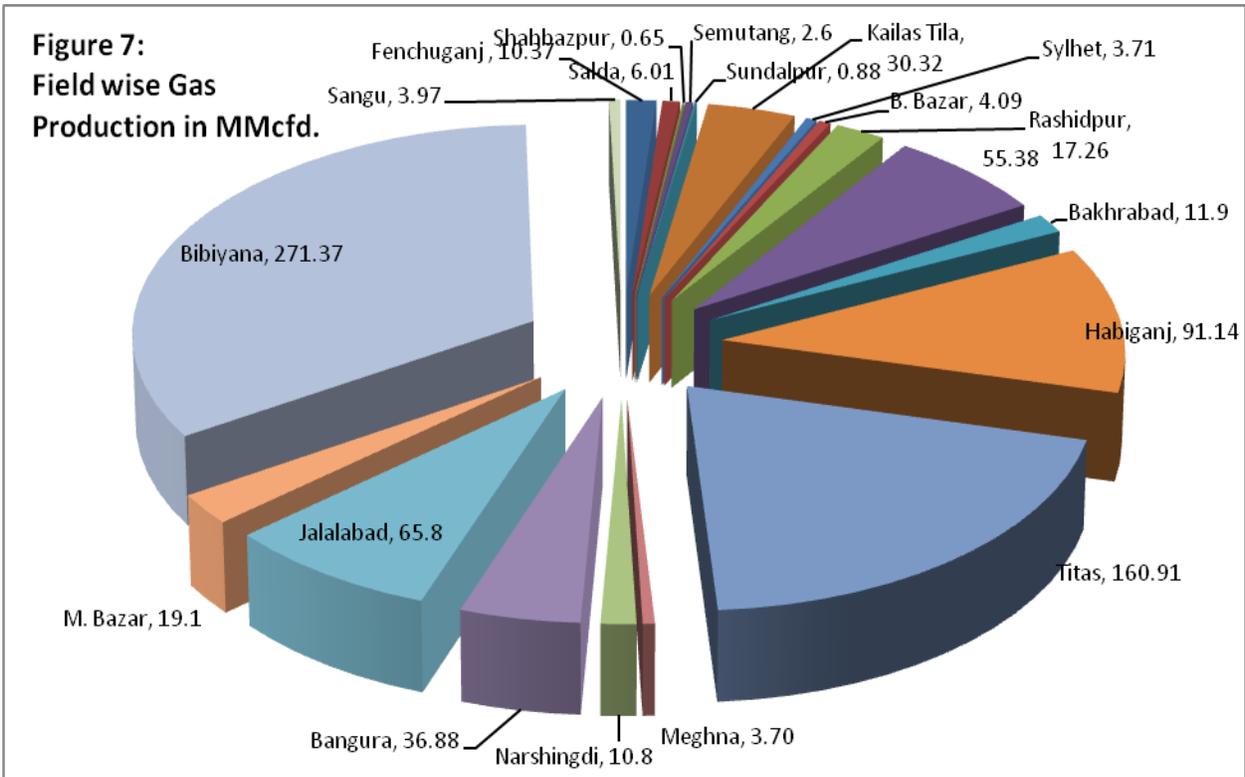


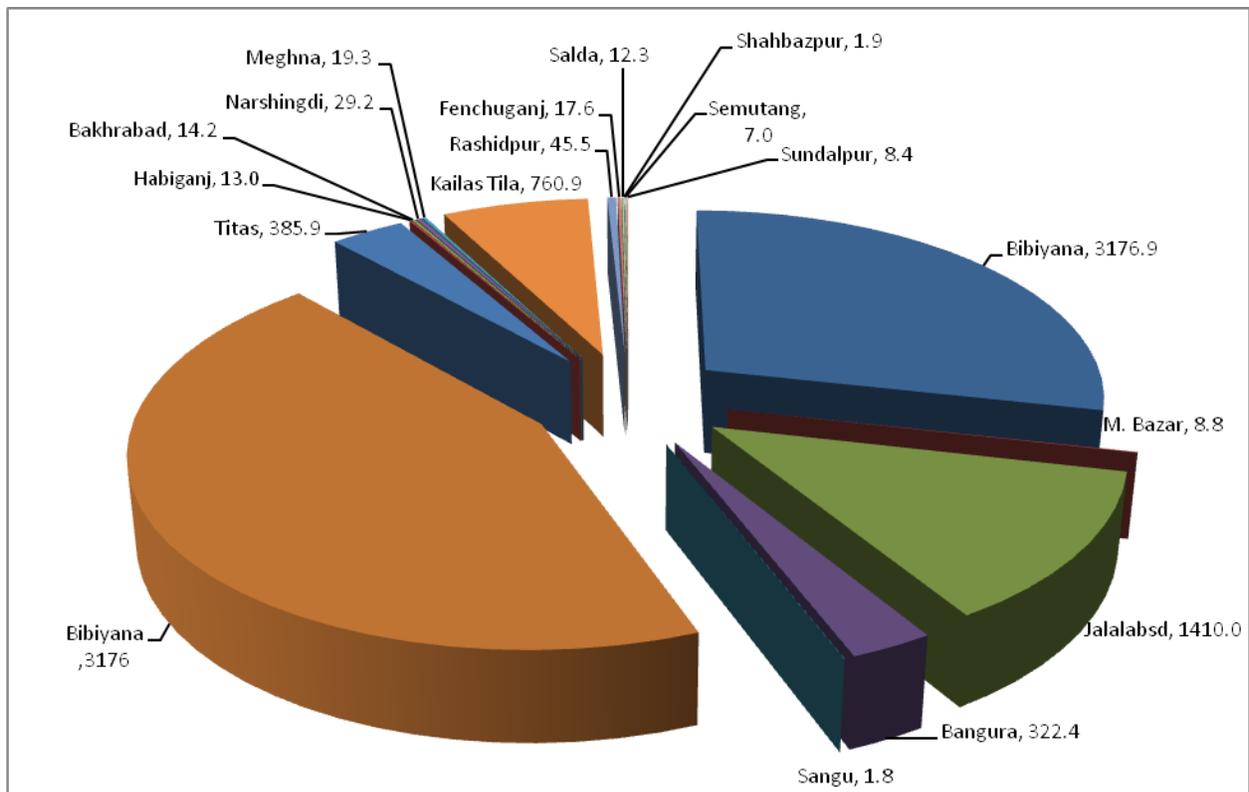


**Figure 6: Company wise Gas Production in MMcfd & Bscf, 201-12**

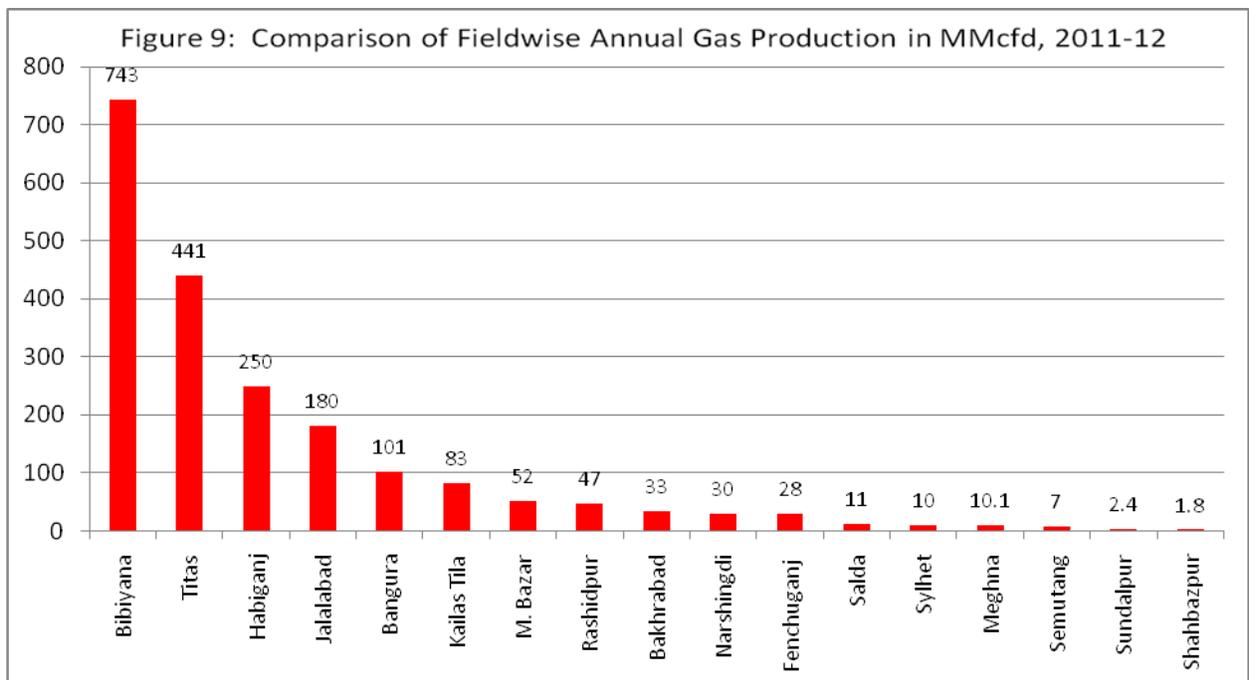


**Figure 7:  
Field wise Gas  
Production in MMcfd.**



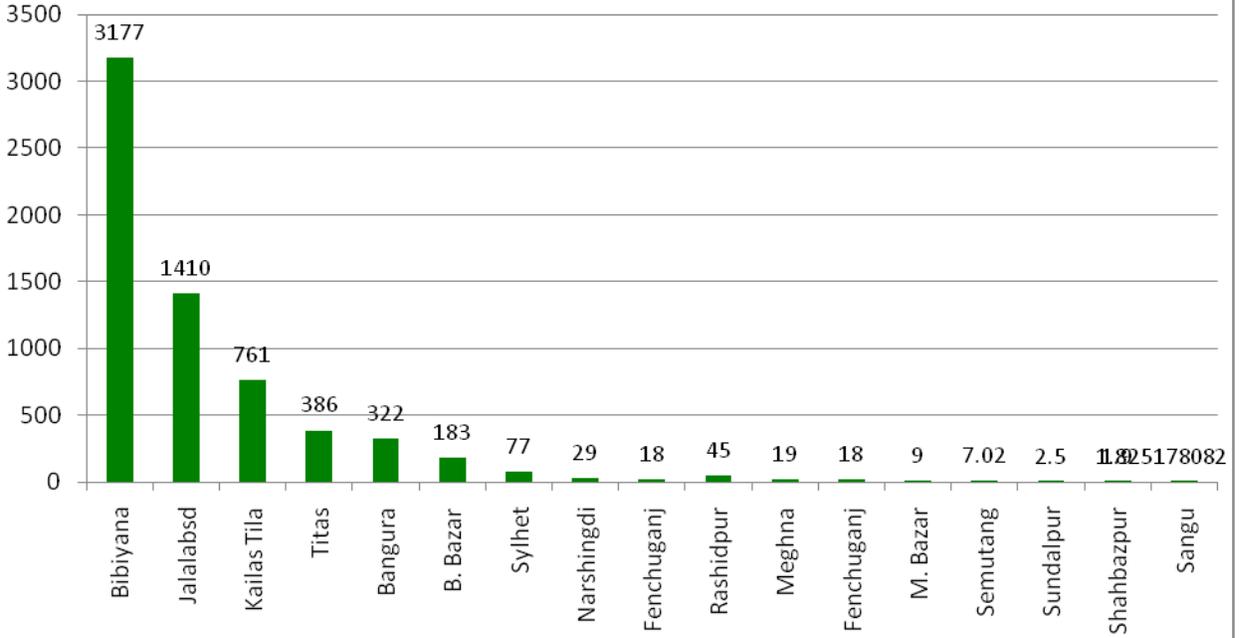


**Figure 8: Field wise Condensate Production in bbl/day.**

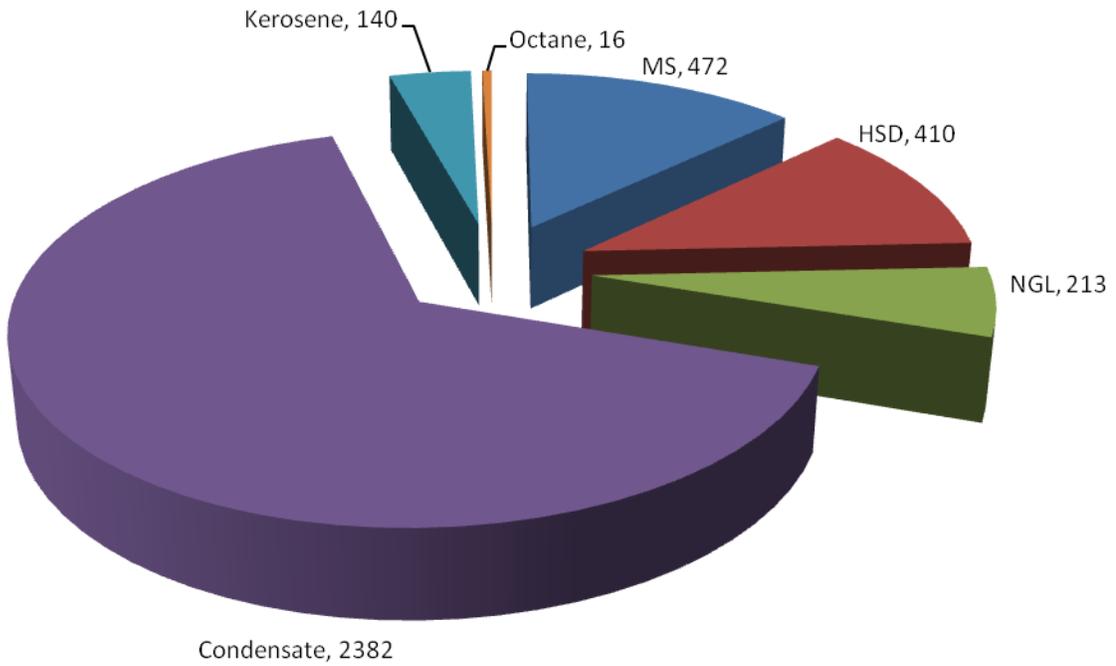


**Figure 9: Comparison of Fieldwise Annual Gas Production in MMcfd, 2011-12**

**Figure 10: Fiels wise Condensate Production in bbl /day, 2011-12**



**Figure 11 : Volume of Liquid in 1000 bbl recocered in 2011-12.**



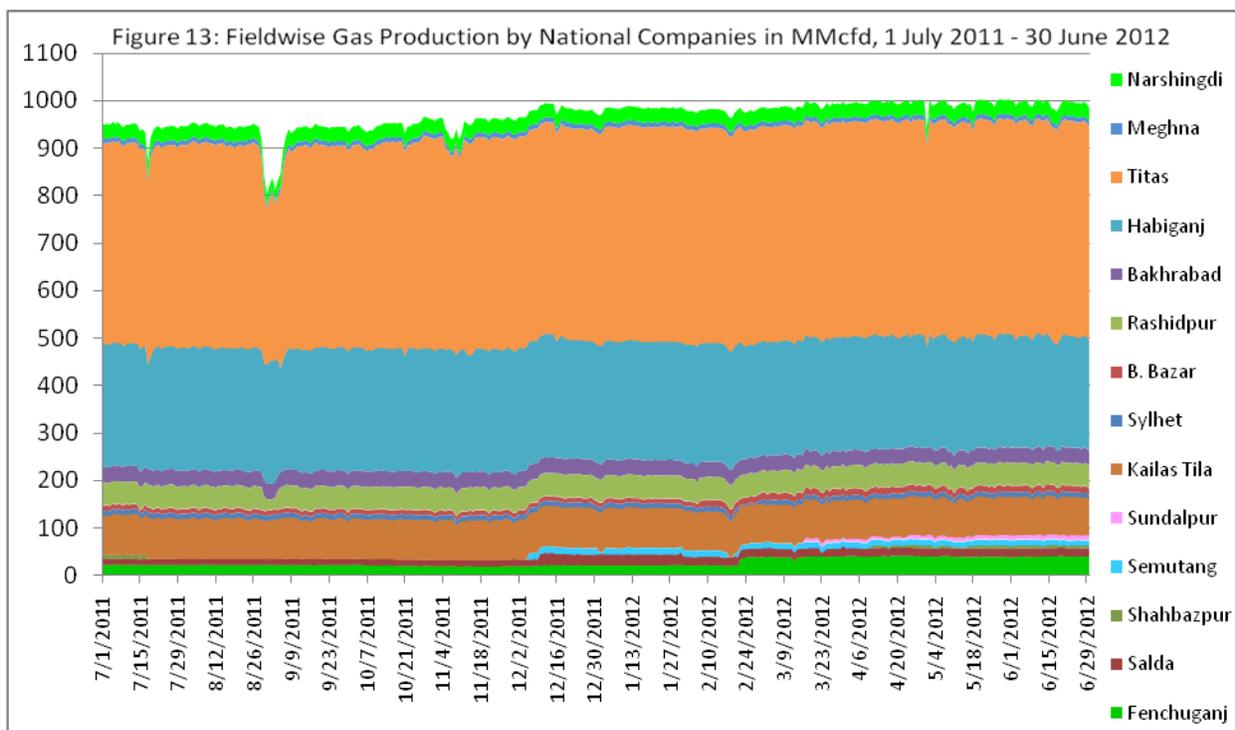
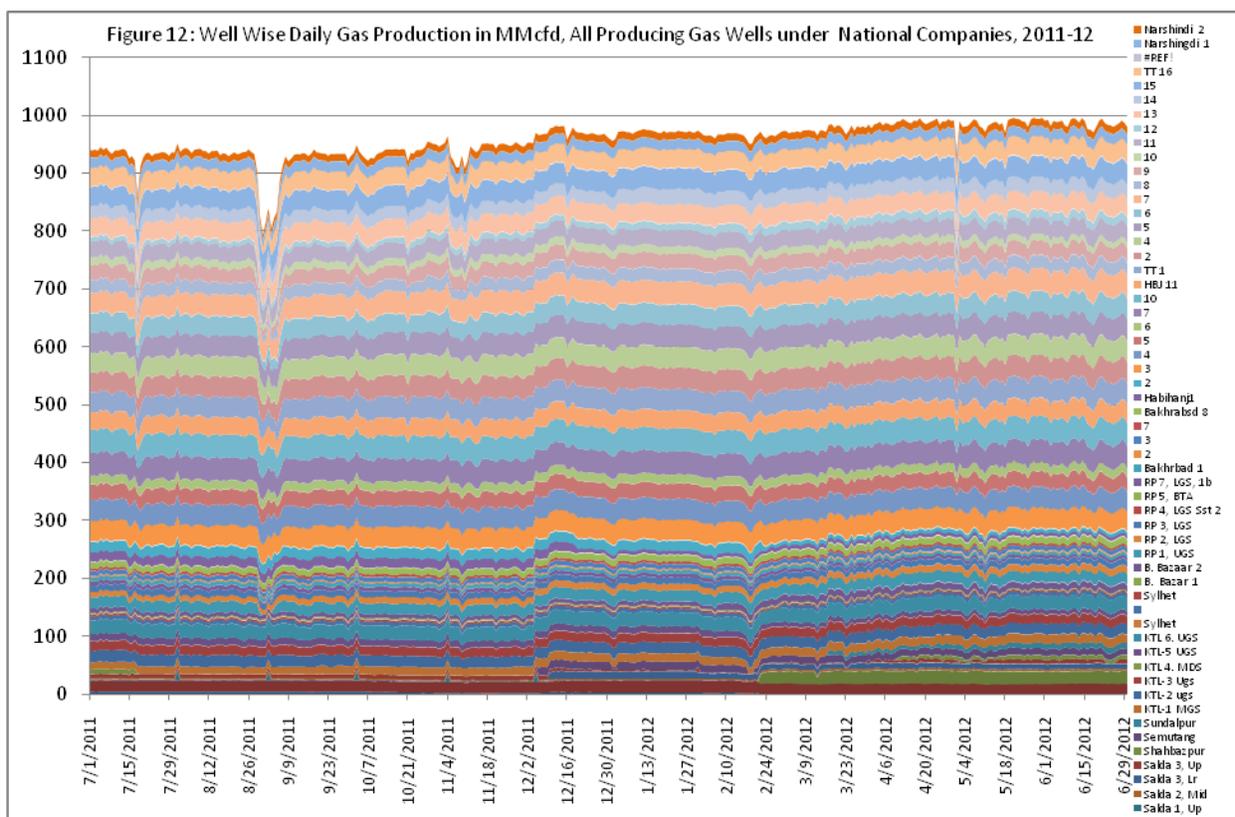


Figure 14: Comparison of Annual Gas Production by National Companies in MMcfd and Bscf, 2011-2012

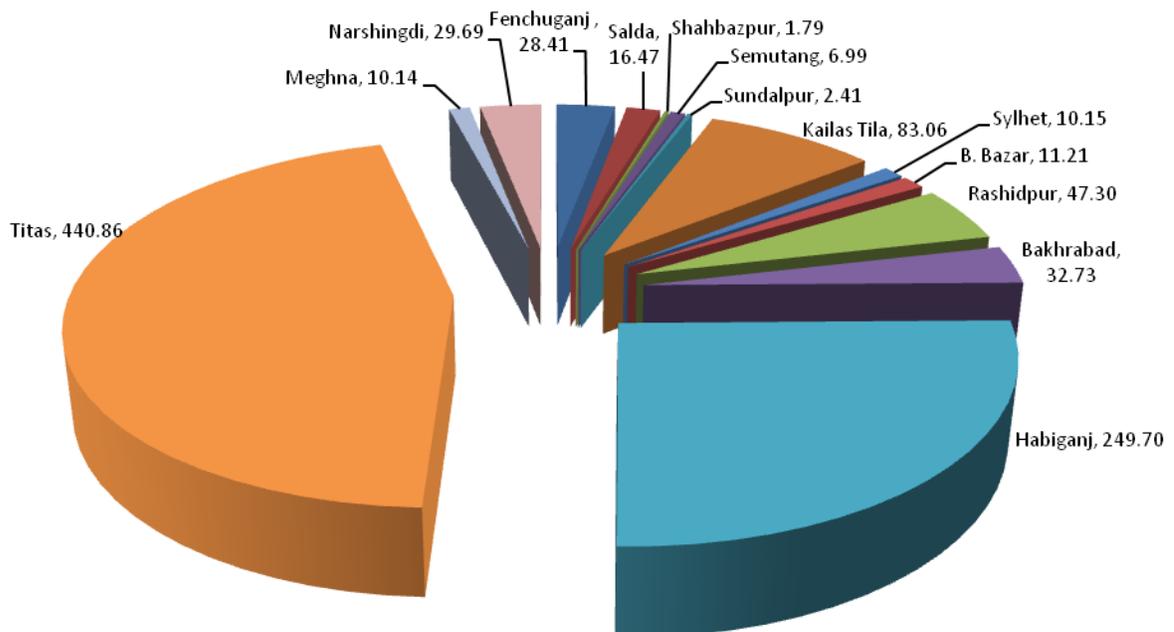
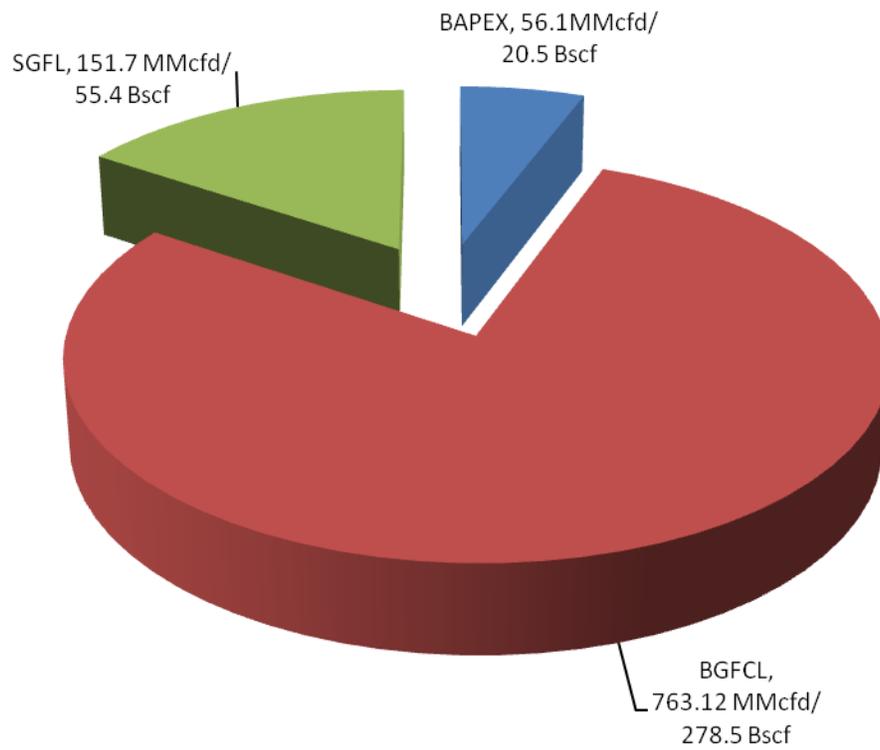
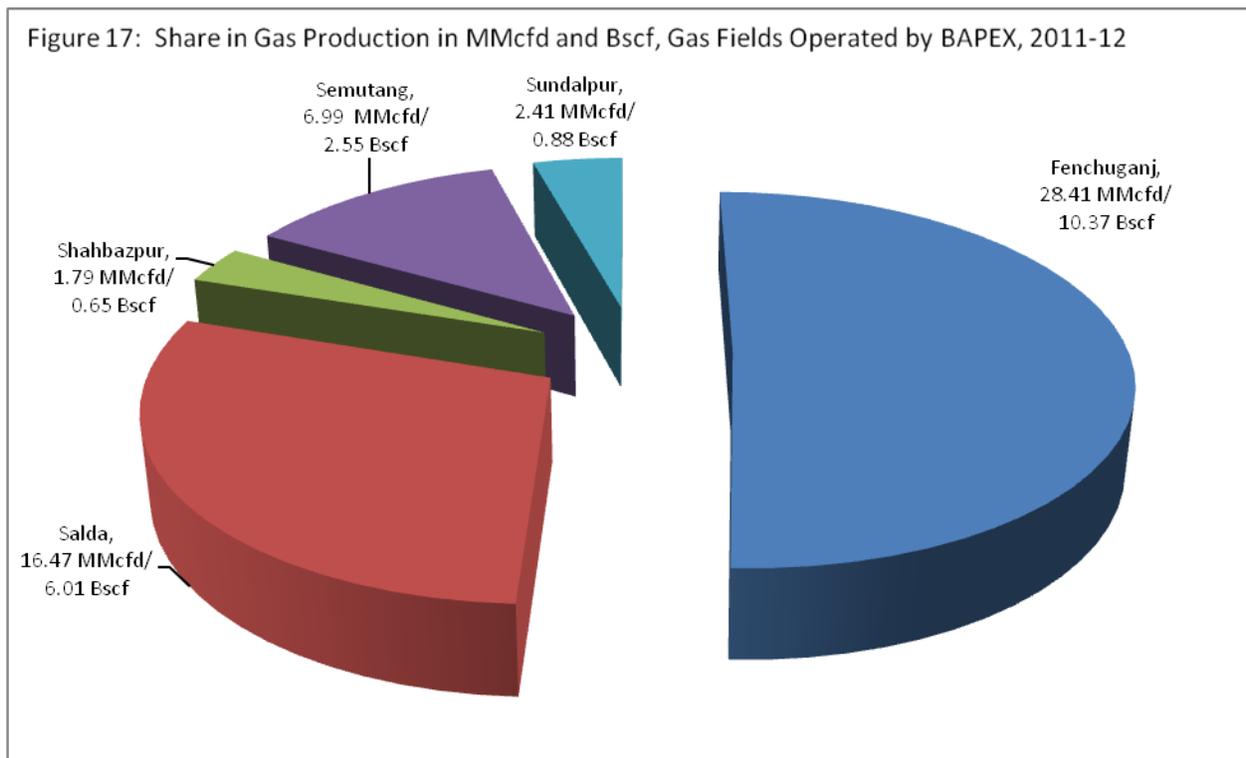
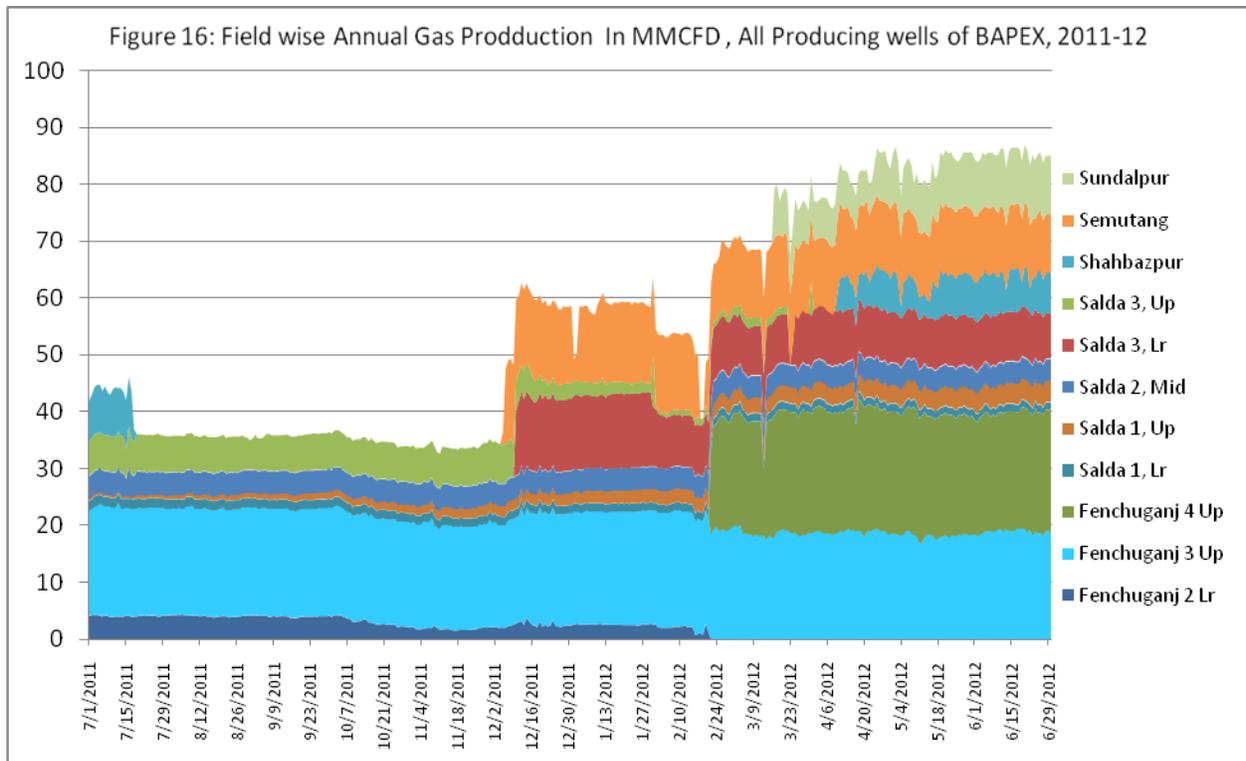
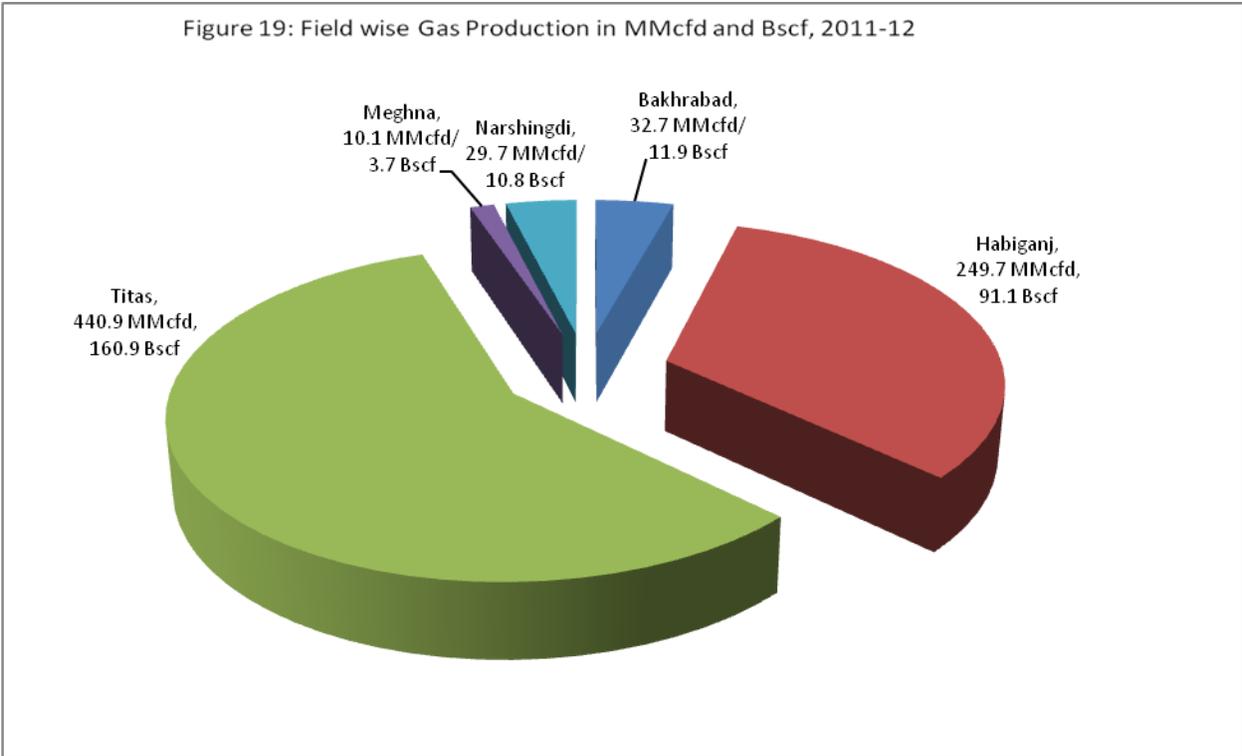
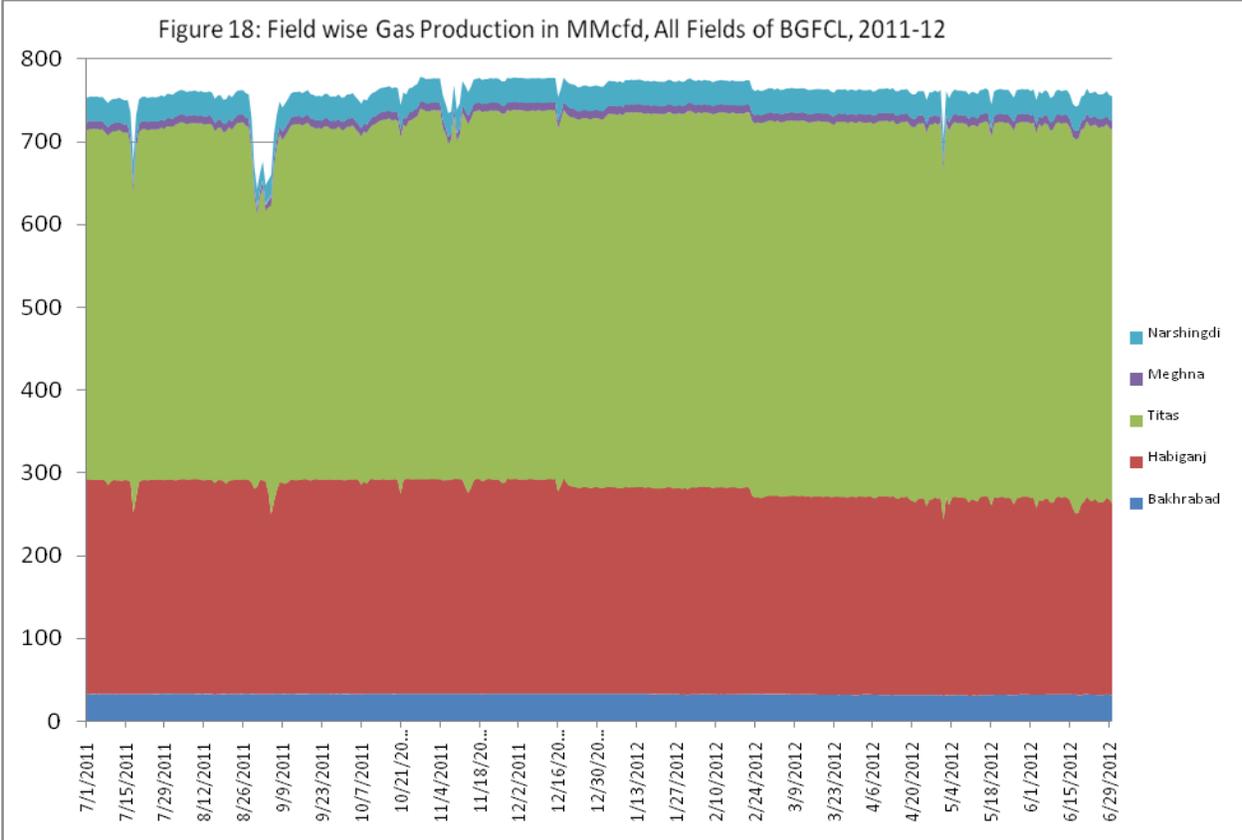
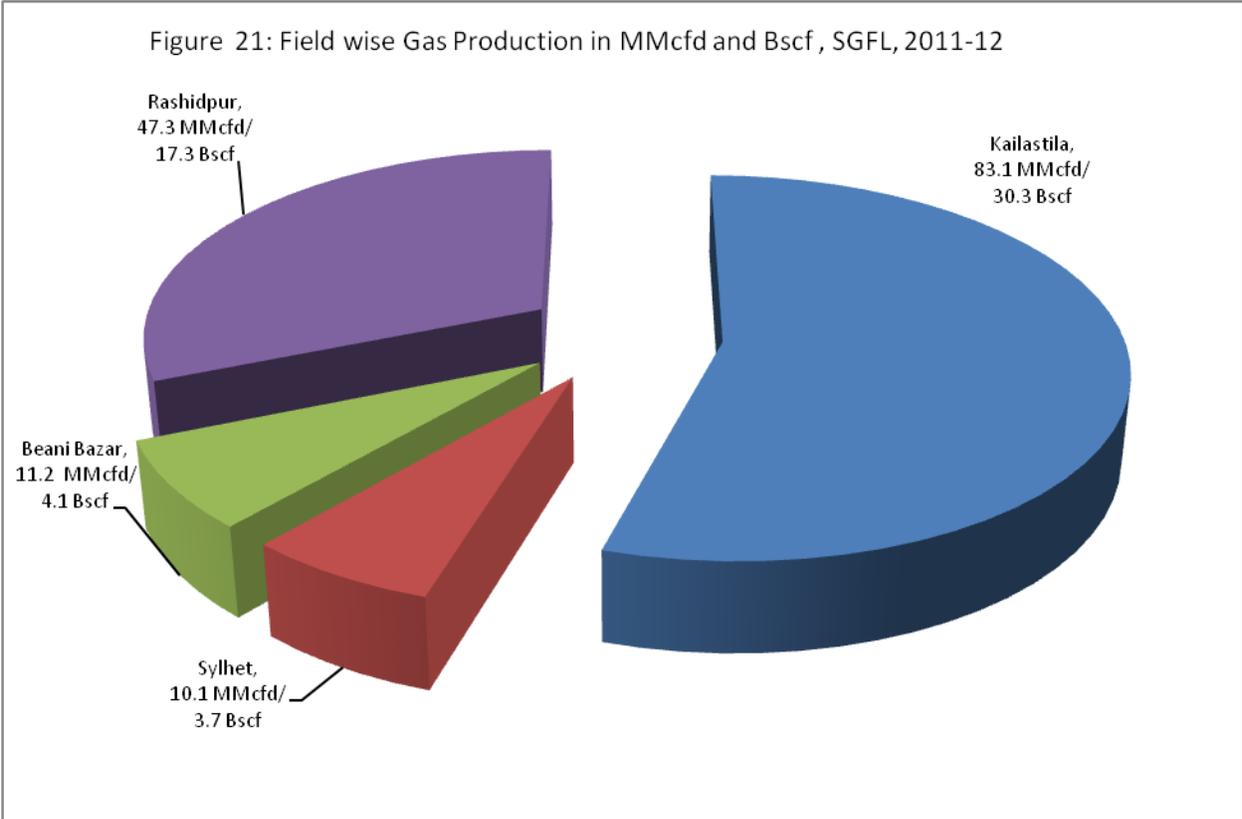
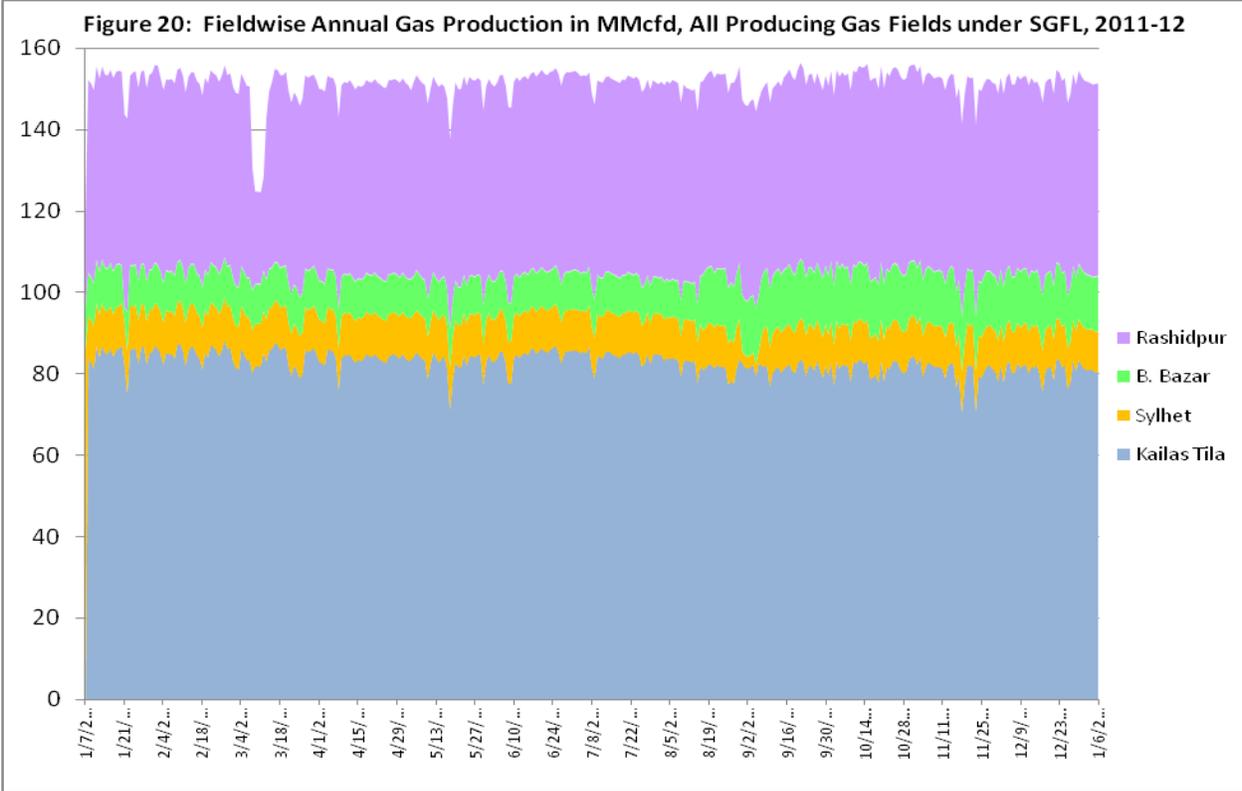


Figure 15: Fieldwise Annual Gas Production of all Producing gas Fields of National Companies, 2011-12







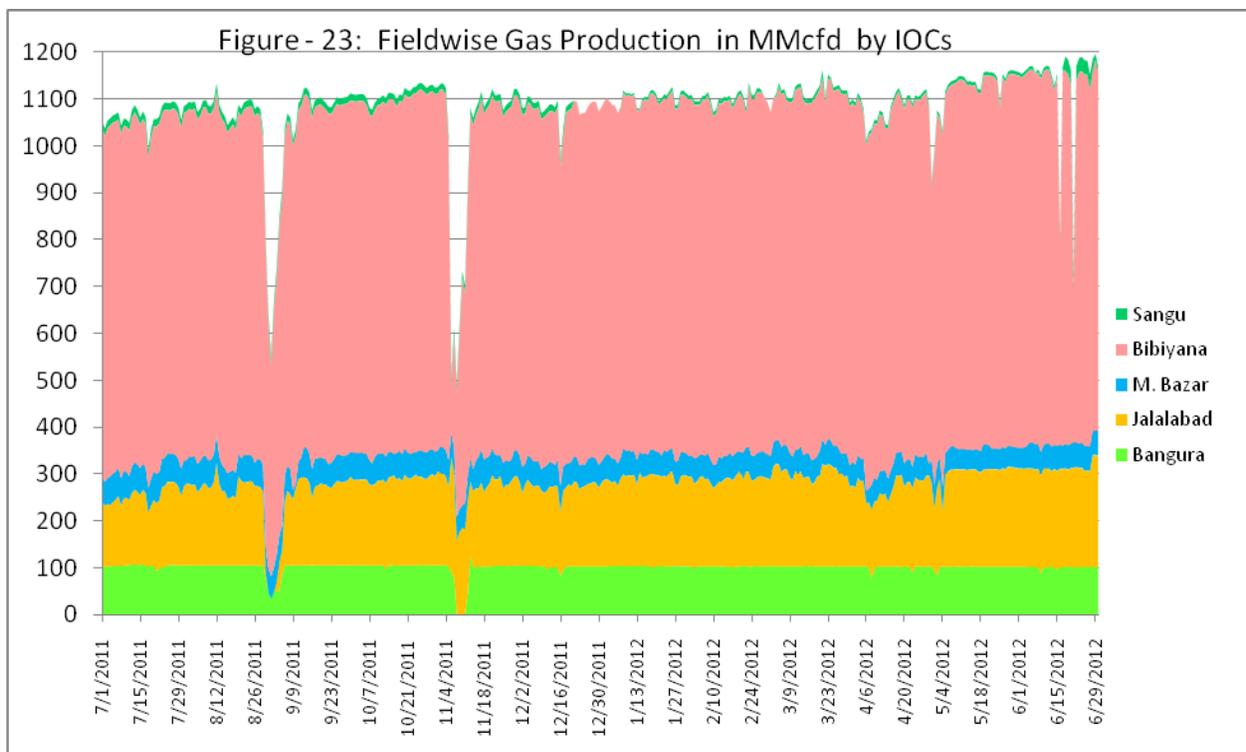
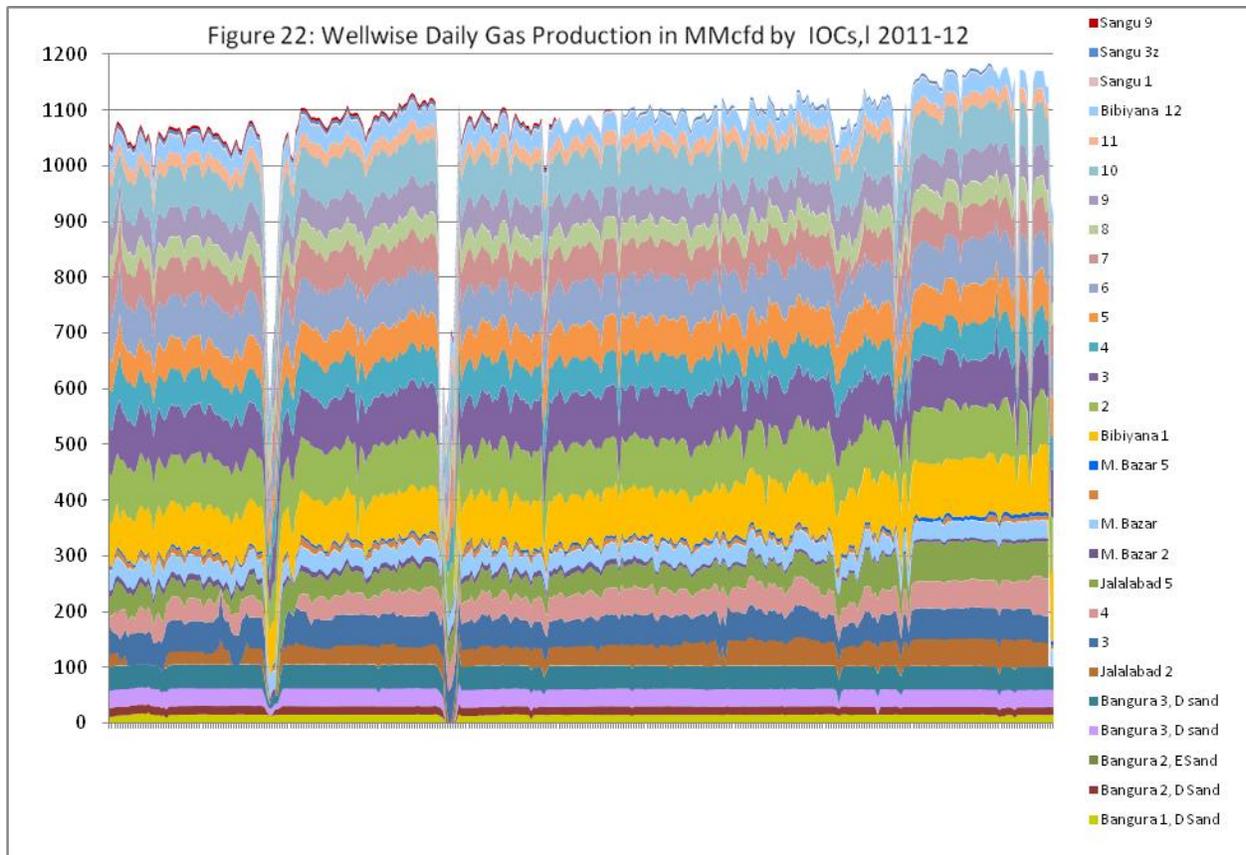


Figure 24: Field Wise Gas Production in MMcfd/Bscf , IOC Operated Gas Fields, 2011-12

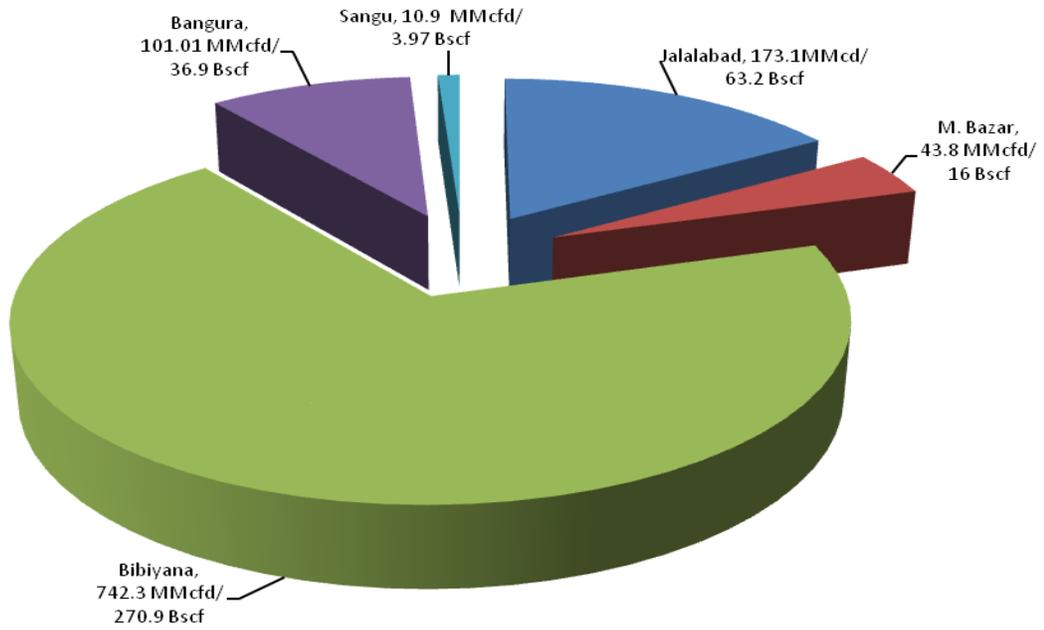
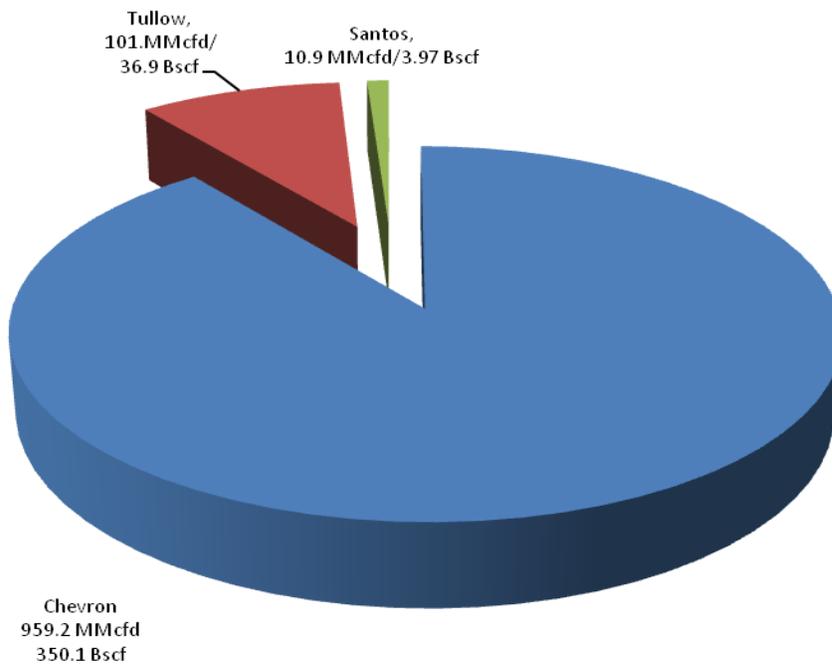


Figure 25: Company wise Annual Gas Production in MMcfd and Bscf, International Oil Companies, 2011-12



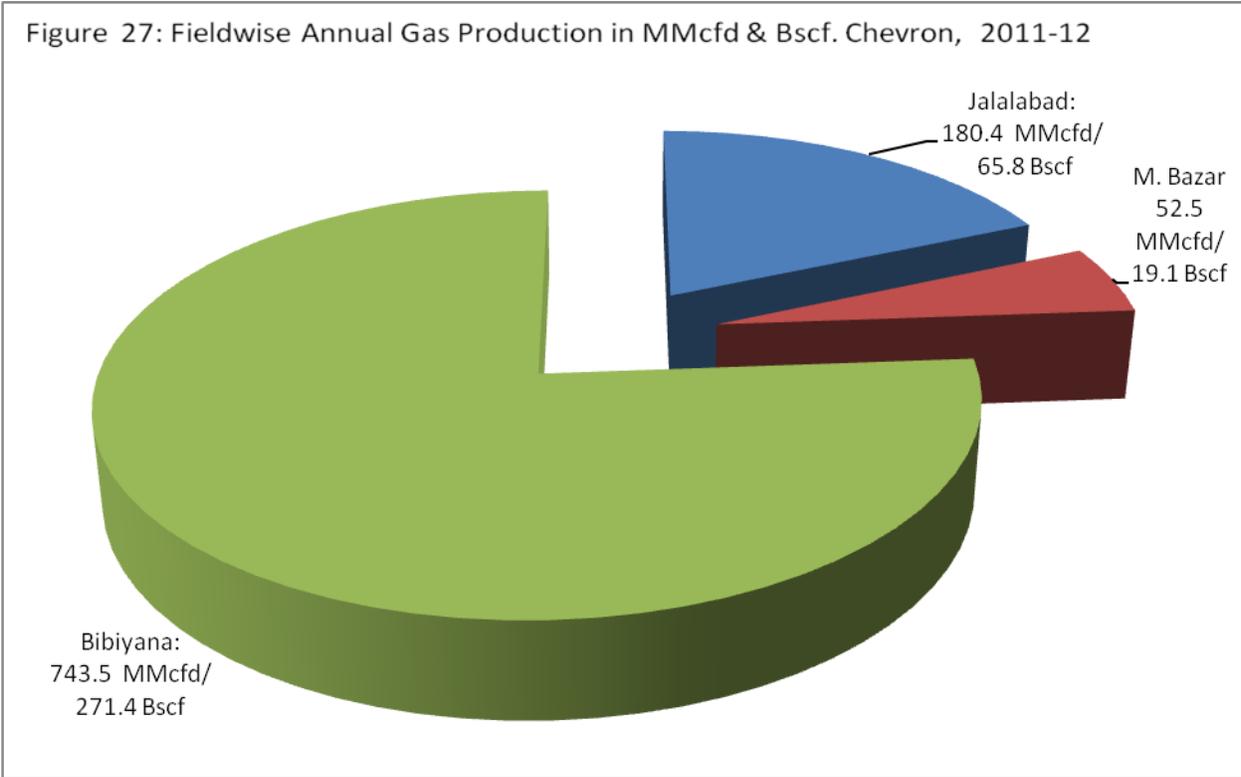
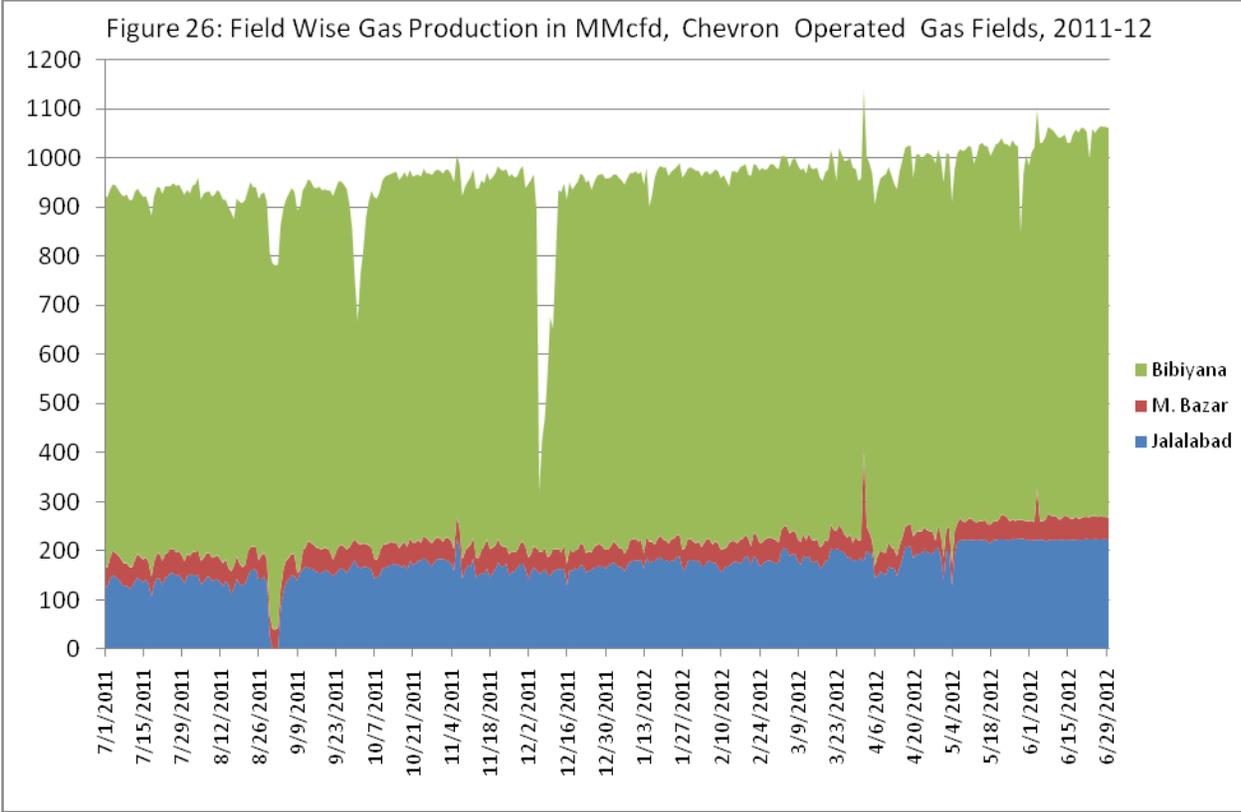


Figure 28: Well Wise Gas Production in MMcf, Tullow Oil, 2011-12



Figure 29: Well wise Gas Production in MMcf, Santos, 2011-12

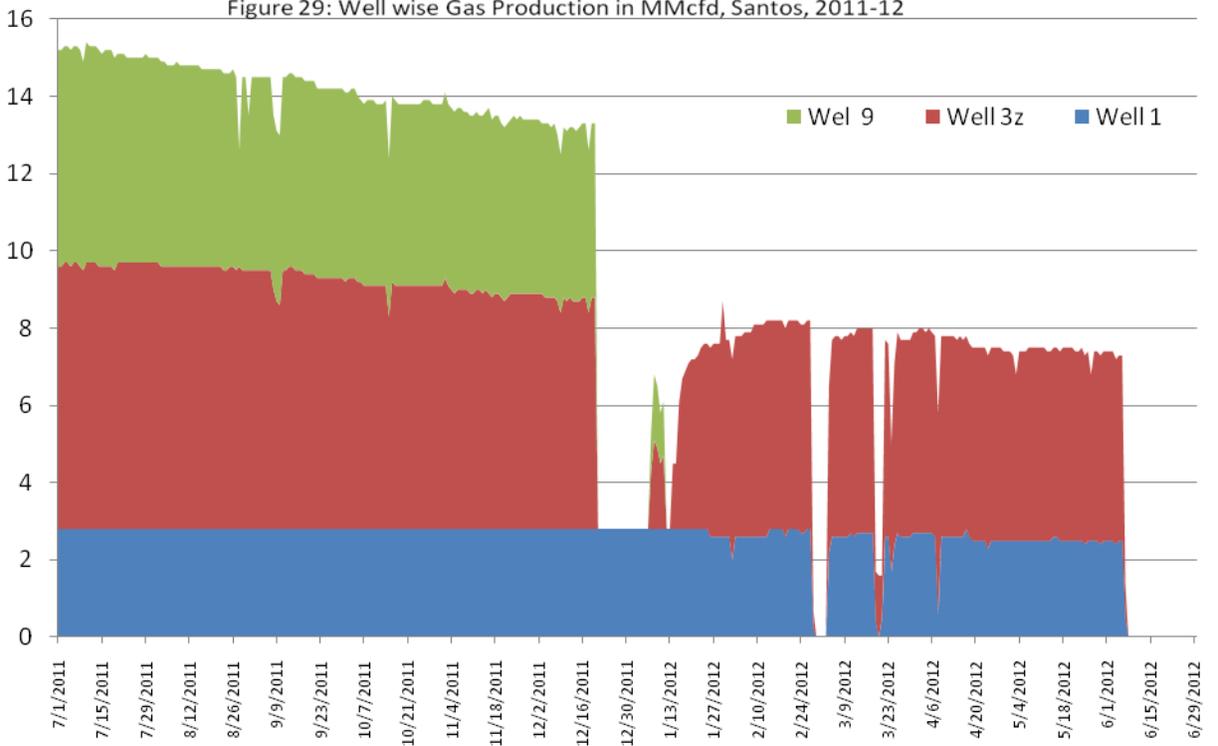


Figure 30: Sector wise Gas Consumption in MMcfd and Bscf, 2011-12

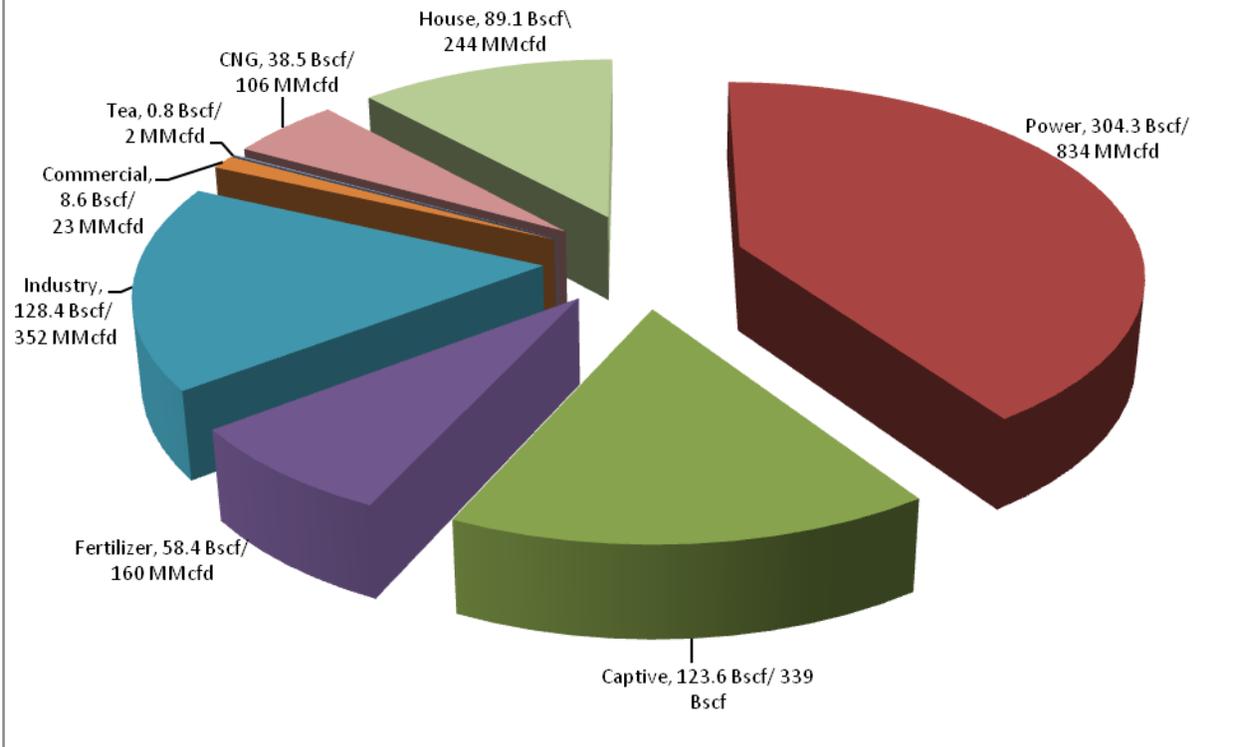


Figure 31: Sectorwise Monthly Gas sales in MMcfd by Distribution Companies, 2011-12

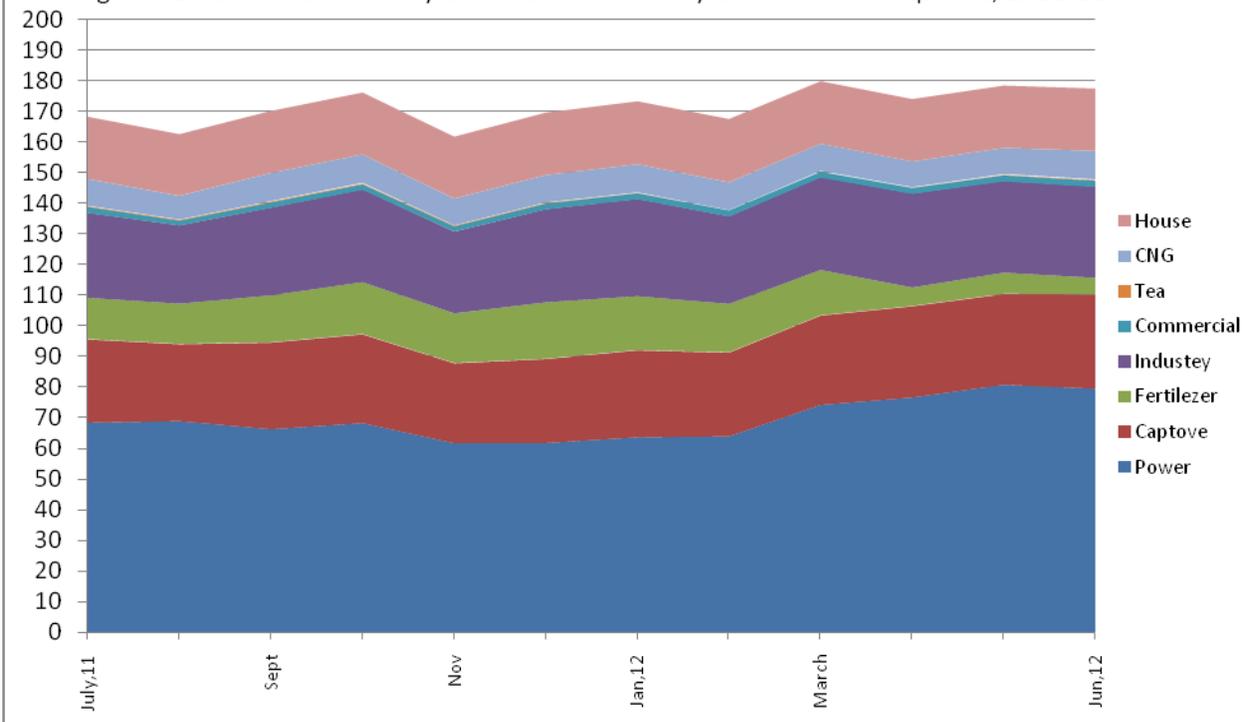


Figure 32: Gas Production in Bscf, Gas Purchase and Sales in Bscf by Distribution Companies, 2011-12

