

TRAINING AND DIALOGUE PROGRAMS



Load Management and Demand Response

Presented by:

ENG. Saleh Abdulrehman AL-Obysi

Saudi General Information

| Year | 2011 |
|---------------------------------------|-------------------|
| Population | 27,136,977 |
| GDP(Billon US\$) | 577 |
| GDP Growth | 14% |
| Area | 2,240,000 |
| Steam Turbines (M.W) | 13986 |
| Combined Cycle (M.W) | 2299 |
| Simple Cycle Gas Turbine (M.W) | 25281 |
| Diesel (M.W) | 358 |
| SEC Total (M.W) | 41,924 |

Key statistics

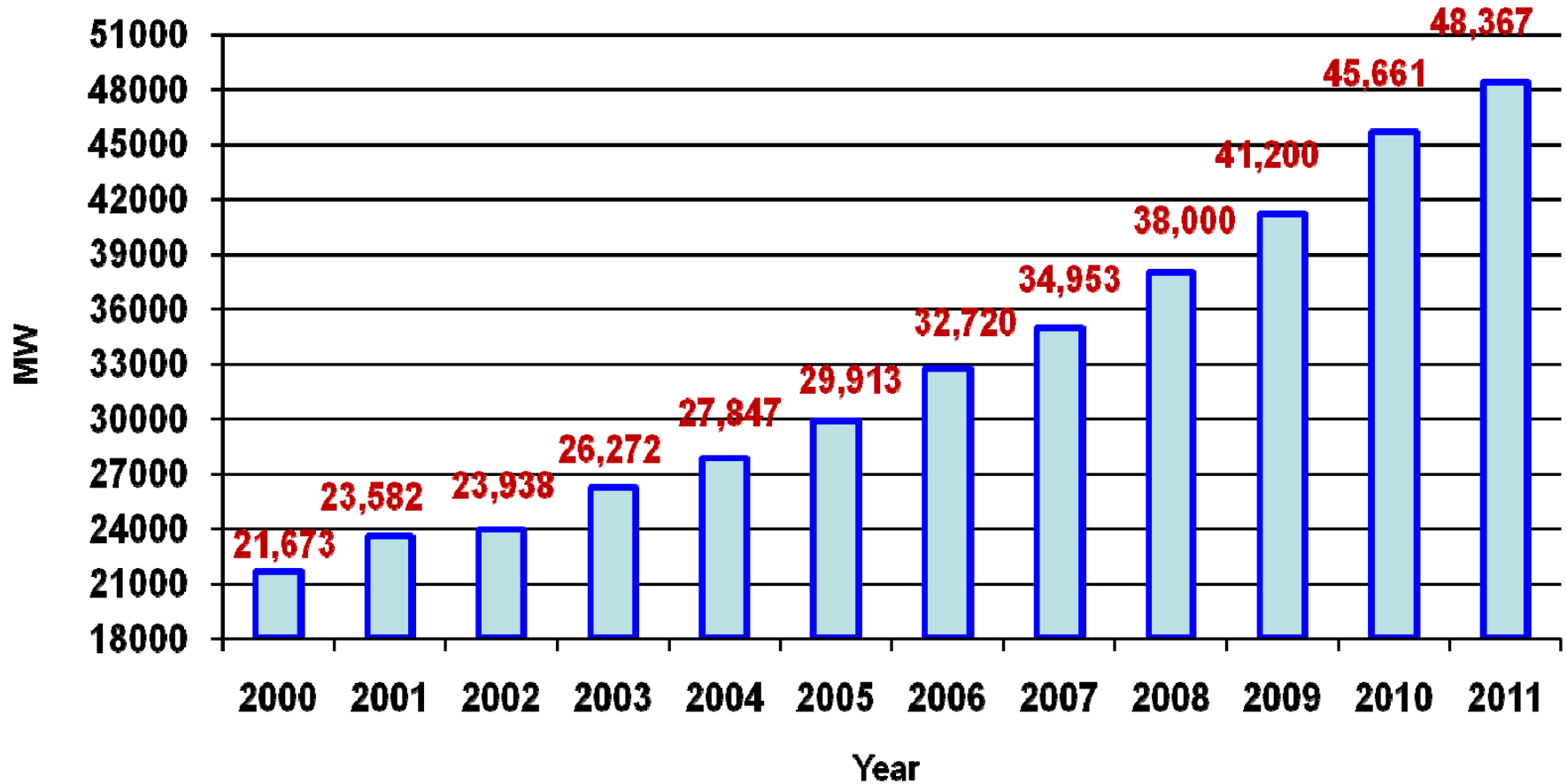
- Average 7% annual growth in peak electricity demand
- 43,317 MW peak in 2010, forecast to 72,100 MW in 2020
- 51% of energy consumed in residential sector
- Up to 70% of peak load could be attributed to air conditioning (residential and commercial buildings)

YEARLY POWER SYSTEM SUMMARY

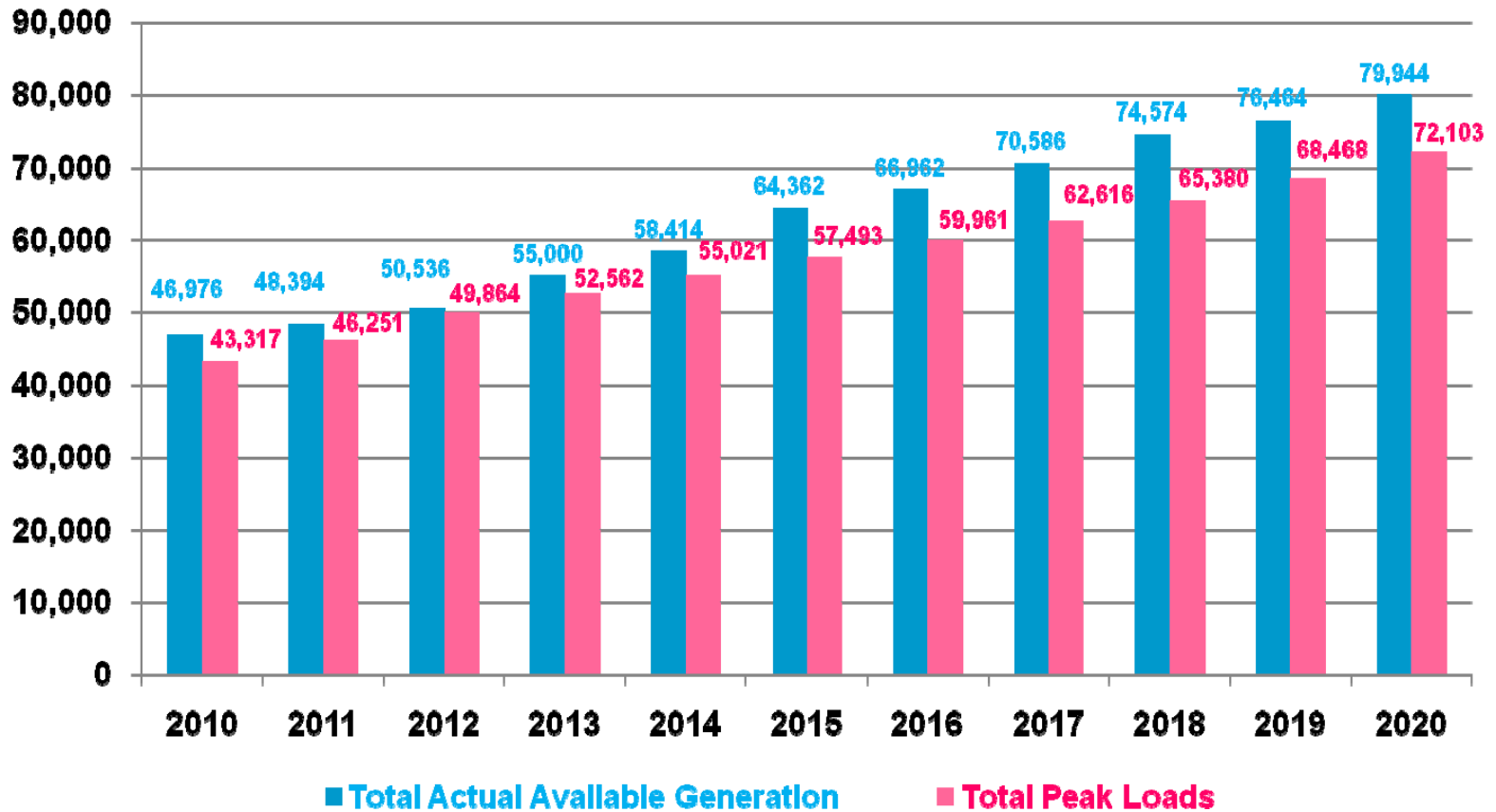
| Peak Last Year (2010) | | | Peak This Year (2011) | | | PARTICULARS |
|-----------------------|--------|--------|-----------------------|--------|----------|-------------------------|
| EOA | COA | CTA | EOA | COA | CTA | |
| 12444 | 14006 | 26450 | 13193 | 14548 | 27741 | Coincident Demands (MW) |
| 12964 | 14066 | 26450 | 13424 | 14548 | 27741 | Peak Demands (MW) |
| 28-Aug | 19-Jun | 19-Jun | 04-Aug | 06-Aug | 06-Aug | Date |
| 16:05 | 15:15 | 15:00 | 14 : 14 | 15:15 | 1515 :00 | Time |
| 41 | 50 | N/A | 44 | 45 | N/A | Temperature (C) |
| 59 | N/A | N/A | 50 | N/A | N/A | Relative Humidity (%) |
| 17099 | 10208 | 26810 | 17210 | 10848 | 28266 | Available Gen cap (MW) |

Development Of Peak Load

Peak Load Increased By 123 % Since 2000



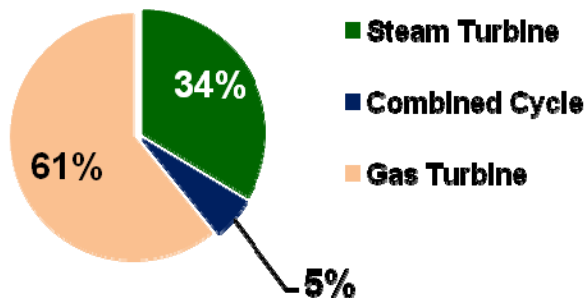
Available Generation Versus Forecast Peak Loads (MW)



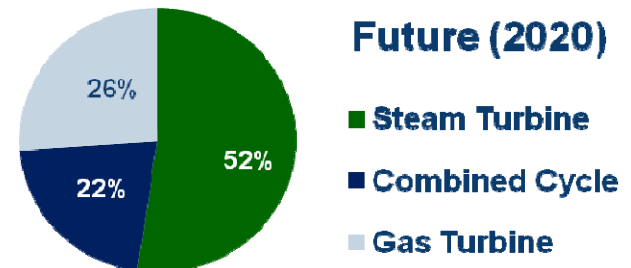
Generation capacity (2011)

| Current (2011) | Capacity (MW) |
|------------------------------|-----------------|
| Steam Turbines | 13986 |
| Combined Cycle | 2299 |
| Simple Cycle Gas Turbine | 25281 |
| Diesel | 358 |
| SEC Total | 4,1924 |
| Non-SEC (WEC and IPP) | 9,223.5 |
| Total | 51,147.5 |

Current (2011)



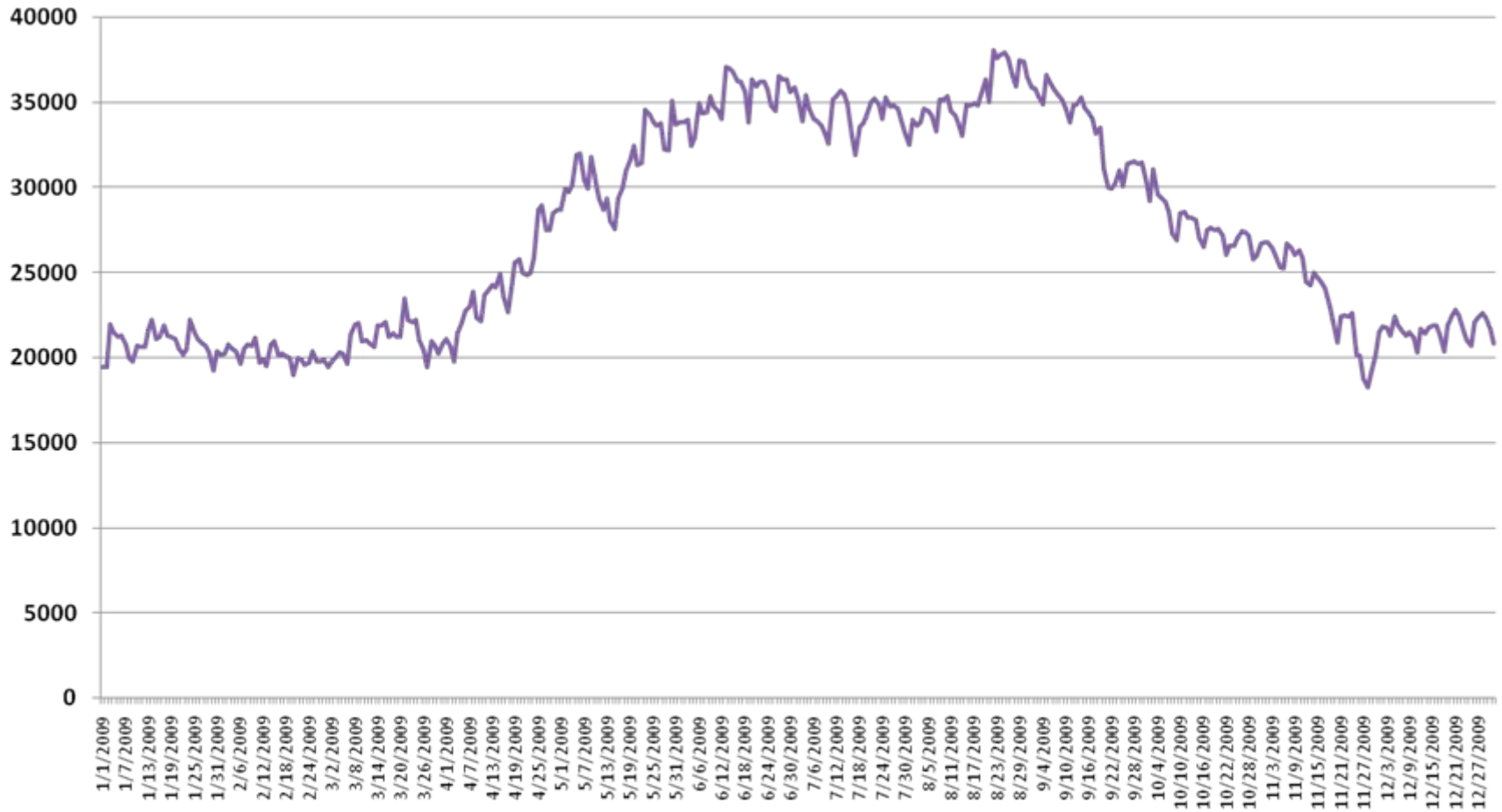
Future (2020)



Challenges facing the Saudi Electricity Company

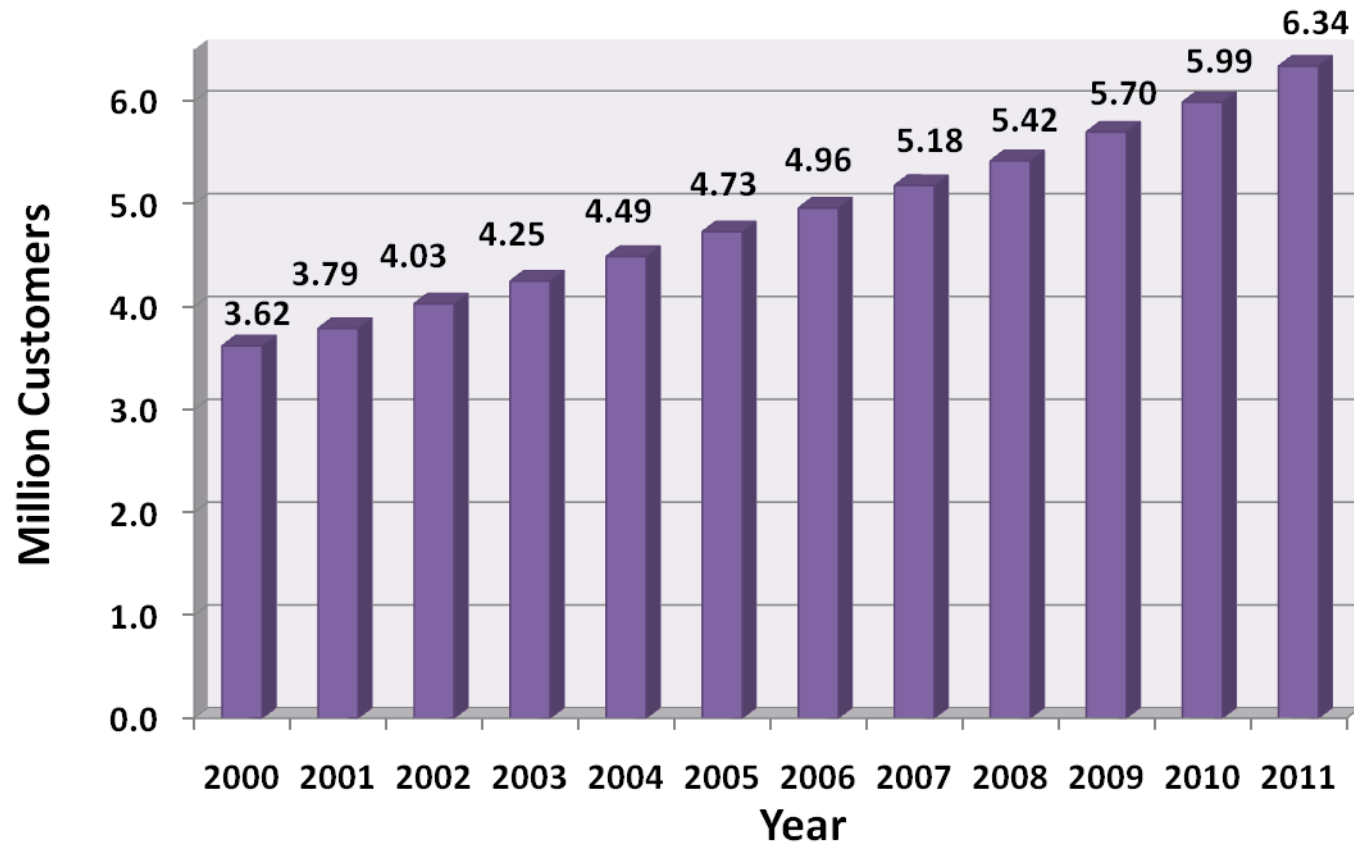
- High annual growth in peak electricity demand (>7%).
- Some generation capacity is used for short time.(1000MW WORK 100 HOUR/ YEAR)

Annual load curve for KSA

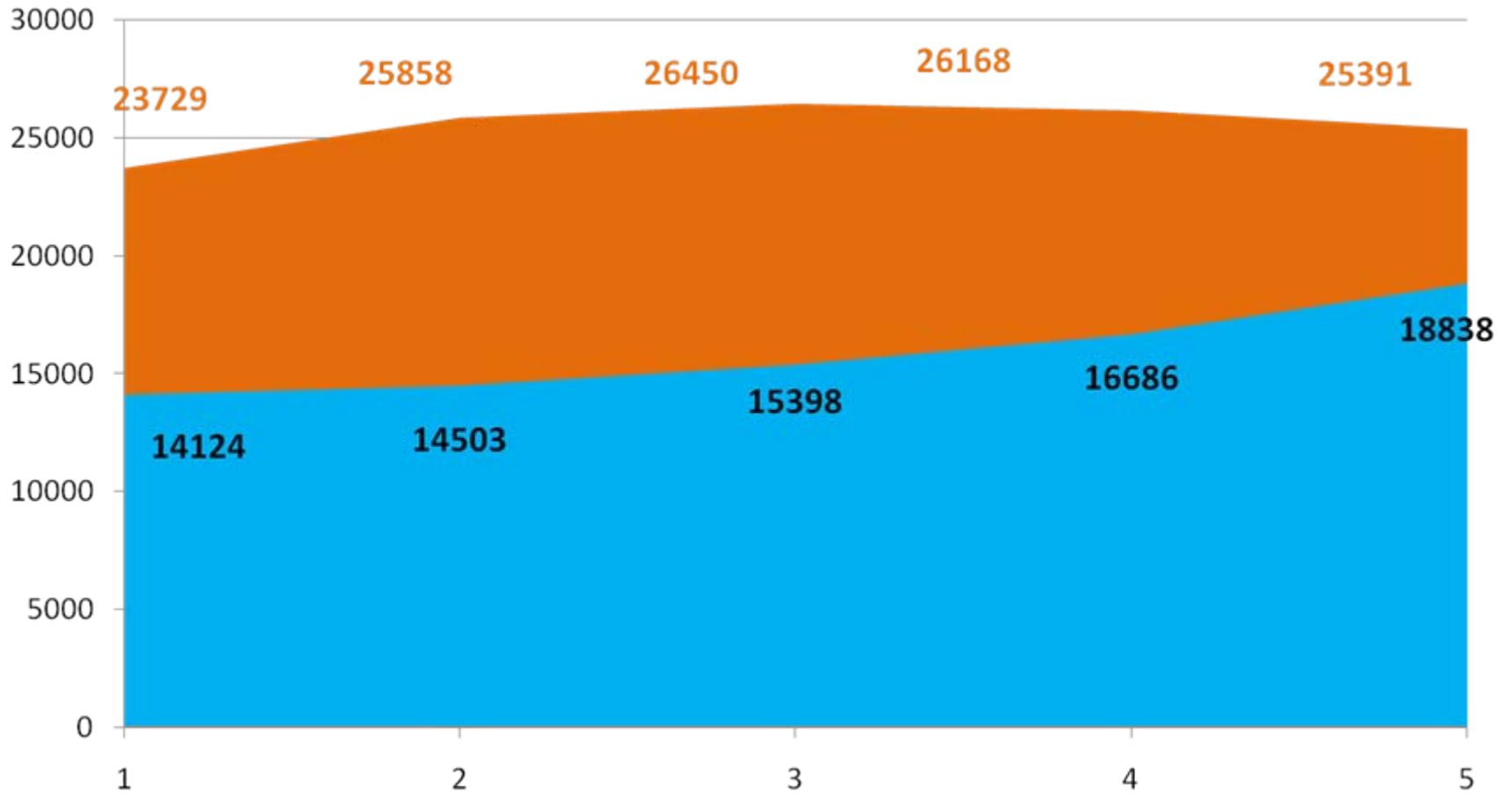


Growth Of Number Of Customers

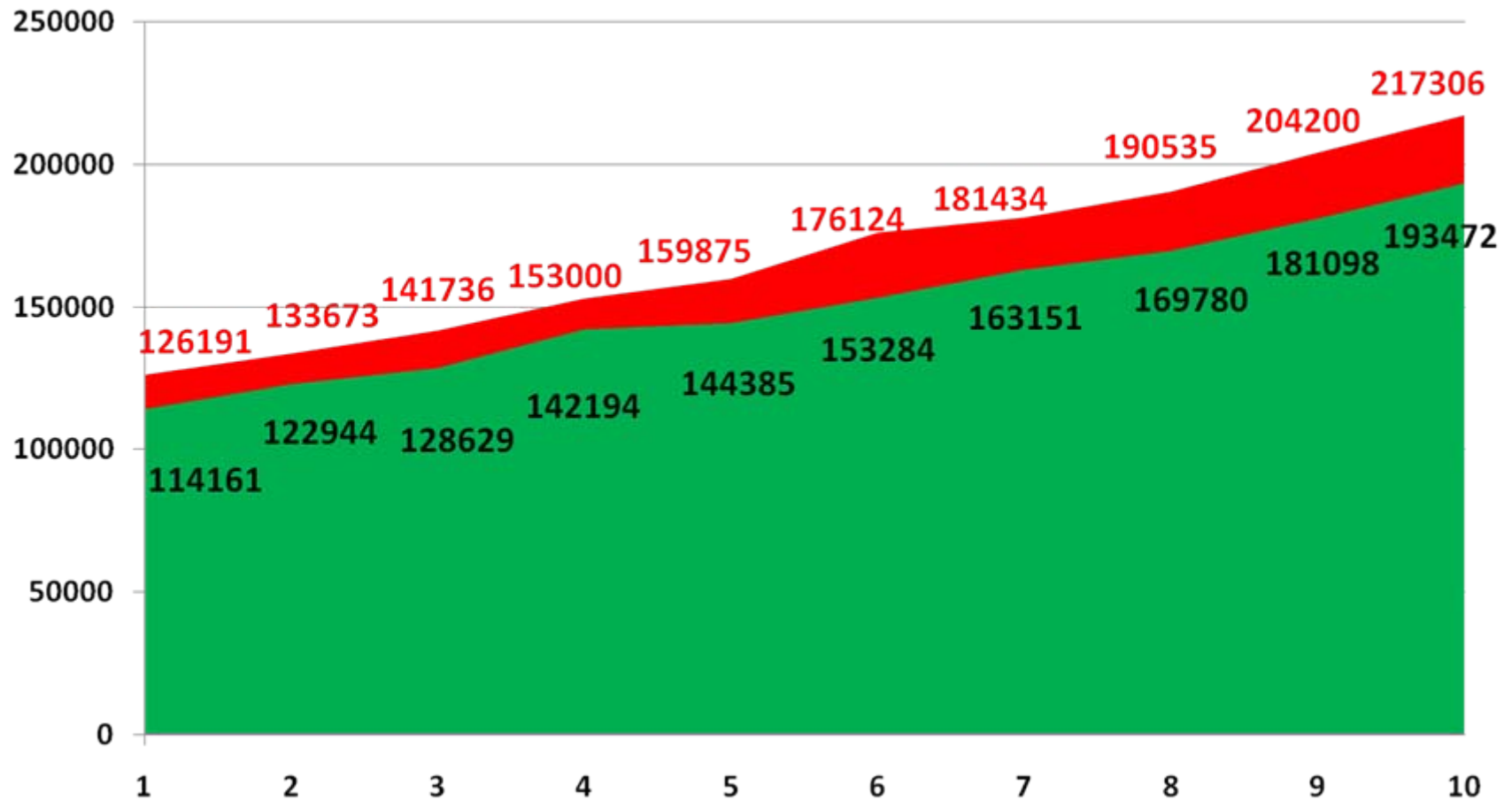
SEC was able to Add (2.7) million New Customers Since Year 2000 With An average annual growth of 6%.



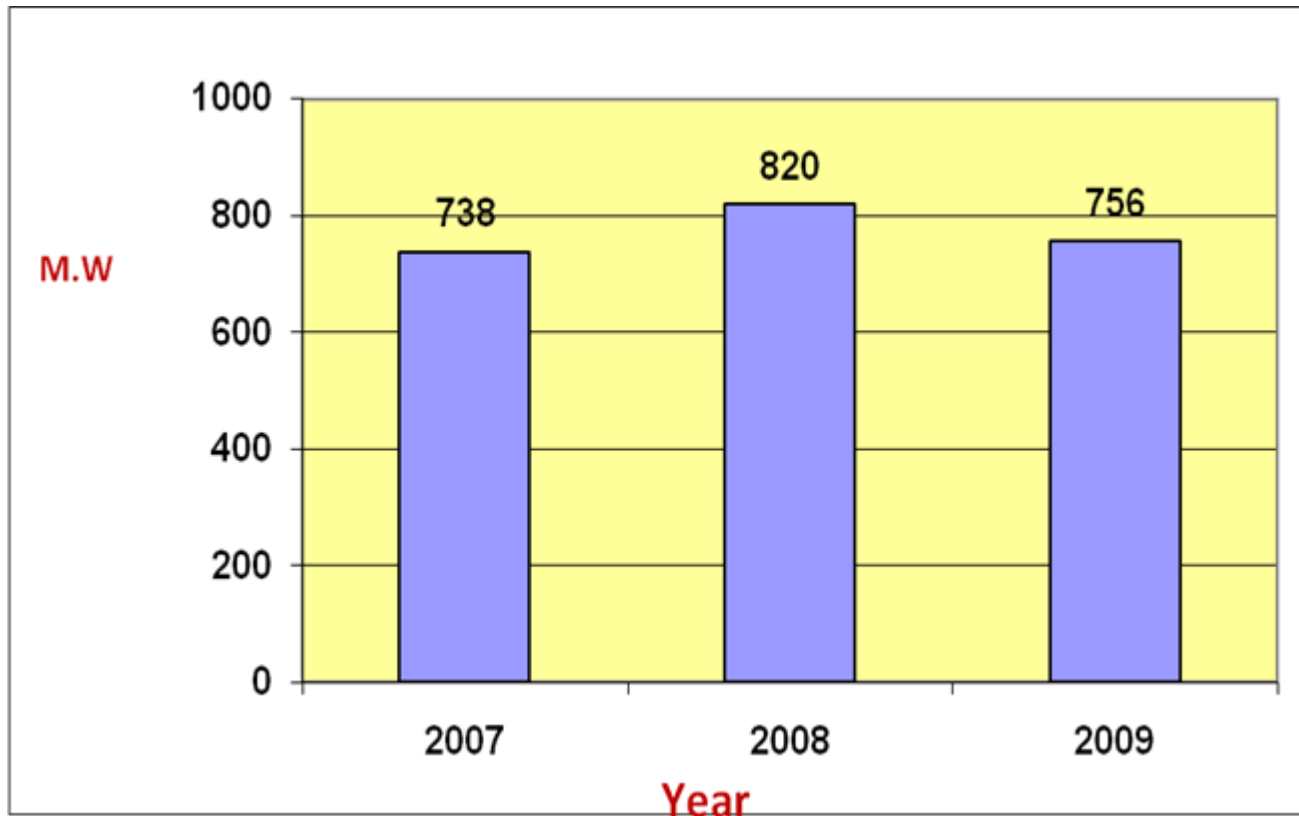
Difference between the electrical load in the night and day



The big difference between produced and sold energy



Generation capacity utilization hours



Solutions that have been applied the S.E.C

- **Time of-use tariff program**
- **Standby generation program**
- **Thermal energy system**
- **Customer awareness**
- **Air conditioning load control**

THANK YOU



Contact : report@tky.ieej.or.jp