ABSTRACT

DSM programs focusing on peak demand reduction in Korea have been implemented and at present time, try to reduce 4,000 MW amounting to 7% of 54,631 MW peak demand in 2005. The long-term power development plan is going to raise the goal of DSM program peak reduction to 11,000 MW, 13% level of peak demand in 2020. Most of the DSM programs were focused on reduce peak demand in summer period using interruptible and voluntary programs. The current peak cutting programs consist of traditional billing incentive program and DLC for large customer. The latter is expected fundamental change in DSM programs during wholesale competition. In addition, this program initiated by government at the first stage will be moving towards DSM bidding in the electricity market during improvement of competition. The Korean government focus on maintain supply adequacy and mitigate price volatility in electricity market. So the DSM programs which obtaining demand-side resource are set as a priority of electricity policy. The key factors in DSM programs are evaluation of peak load potential by program during resource planning period. Most of peak load programs target cover large customer in commercial and industrial sector. At first, this paper suggest to approach analyze on demand resource assessment by end-use and identify achievable load potential by measures before implementation. And we estimate program potential during peak load period for the customer by several end-use like HVAC, lighting, driver, inverter, pump etc. And then we forecast DSM resource by suggesting methodologies by program during horizon years. Finally, we suggest the implementation process and DSM goal setting mechanisms considering program portfolio and cost effectiveness under constraints like supply option, budget etc.

1. INTRODUCTION

The objective of this paper is to assess DSM program potential for power development planning in Korea. This paper focused on demand reduction and energy saving estimation during the planning horizon more than 10 years. Our study relied on an analysis of historic annual data and demand forecast before DSM by government sources including in progress data of planning committee. The first step in the analysis is to develop a forecasting approach of peak reduction and energy saving by programs. Next is to conduct a simulation by alternative scenarios. Finally we suggest DSM performance target for long term resource plan. For these purpose new measurement & evaluation mechanism is being prepared for evaluating programs. It is required that the direction and goal of DSM programs should incorporate sustaining reduction of the peak load for preparing electricity supply/demand imbalance and expanding energy efficiency program for energy conservation and environment issues. Under this background, establishing goal and implementation mechanism of DSM should be preceded and developing effective program and strategy for achieving the above goals become major emerging issues in electricity industry. In particular, since the government wants to maintain adequate DSM resources through DSM investment, it is necessary to develop a new approach and program based on supply/demand balance analysis reflecting demand resource.
2. Peak Load Reduction Target in Resource Plan

2.1. DSM program

The DSM program in Korea has been implemented starting with rebate program in 1974 and seasonal time differentiation rate program in 1977. Since then, in 1990s energy high efficiency technology development was promoted such as electric ballast, compact fluorescent, thermal energy storage system and cooling storage system. In 2001, 3 new programs such as inverter, high efficiency motor, DLC (Direct Load Control) have been implemented.

DSM programs largely consist of load management rebate program, load management special rate program and energy efficiency program. The current programs are shown in Table 1.

<table>
<thead>
<tr>
<th>DSM Programs</th>
<th>Purpose</th>
<th>Applicable Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer vacation period coordination rate</td>
<td>Peak Load Shedding</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Voluntary Energy Conservation Rate</td>
<td>Peak Load Shedding</td>
<td>Commercial &amp; Industrial, Education</td>
</tr>
<tr>
<td>Emergency Load Reduction</td>
<td>Peak Load Shedding</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Cooling Storage System</td>
<td>Peak Load Transfer</td>
<td>Commercial &amp; Education</td>
</tr>
<tr>
<td>High Efficient Vending Machines</td>
<td>Peak Load Shedding</td>
<td>Commercial</td>
</tr>
<tr>
<td>Direct Load Control(DLC)</td>
<td>Peak Load Shedding</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Remote control Air Conditioner</td>
<td>Peak Load Shedding</td>
<td>Residential &amp; Commercial</td>
</tr>
<tr>
<td>Energy Efficient Lamp</td>
<td>Energy Conservation</td>
<td>Customer Above 6kW Saving</td>
</tr>
<tr>
<td>Energy Efficient Inverter</td>
<td>Energy Conservation</td>
<td>Industrial Customer</td>
</tr>
<tr>
<td>Energy Efficiency Motor</td>
<td>Energy Conservation</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Gas Cooling System</td>
<td>Load Substitute</td>
<td>Commercial</td>
</tr>
<tr>
<td>Peak Load Management System</td>
<td>Peak Load Shedding</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Energy Efficiency Pump</td>
<td>Energy Saving</td>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Energy Efficiency Transformer</td>
<td>Energy Saving</td>
<td>Large customer</td>
</tr>
</tbody>
</table>

2.2. Performance

After 1990s, due to high growth of peak load, difficulty of power plant financing, emergence of environment and siting issues, the construction of new power plant became difficult. Hence, the performance of peak reduction increased gradually. In 1995, the ratio of peak reduction relative to system peak load was about 3.9% and increased to 7.0% in 2000, 7.7% in 2004, and 8.6% in 2005, respectively. In 2006, the peak reduction of load management was increased to 6,669MW, 10.2%.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve</td>
<td>7.0</td>
<td>12.4</td>
<td>13.9</td>
<td>12.2</td>
<td>11.3</td>
<td>10.5</td>
</tr>
<tr>
<td>Demand before DSM</td>
<td>31,085</td>
<td>43,866</td>
<td>49,234</td>
<td>55,519</td>
<td>59,787</td>
<td>65,663</td>
</tr>
<tr>
<td>Peak Load After DSM</td>
<td>29,878</td>
<td>41,007</td>
<td>45,773</td>
<td>51,264</td>
<td>54,631</td>
<td>58,994</td>
</tr>
<tr>
<td>Peak Reduction By DSM</td>
<td>1,207</td>
<td>2,859</td>
<td>3,461</td>
<td>4,255</td>
<td>5,156</td>
<td>6,669</td>
</tr>
<tr>
<td>DSM Performance (%)</td>
<td>3.9</td>
<td>6.5</td>
<td>7.0</td>
<td>7.7</td>
<td>8.6</td>
<td>10.2</td>
</tr>
</tbody>
</table>

※ Generating Capacity and Reserve Margin is based on summer peak load.
The peak reduction volume has been increased annually from 3,461MW in 2002 to 6,669MW in 2006. Among them, the volume of demand management program has been increasing from 2,530MW in 2002 to 4,423MW in 2006, covered 87.1% of total reduction. On the contrary, the portion of energy efficiency program accounts for 12.9% of total DSM programs, which remains relatively at a small scale. In past, the DSM policy has focused on load management because the stabilization of supply/demand imbalance.

![Figure 1. Peak Load and Peak Reduction](image)

### Table 3. Peak Reduction by Programs

<table>
<thead>
<tr>
<th>DSM Measures</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>① Tariff System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVPC</td>
<td>1,091</td>
<td>1,128</td>
<td>1,191</td>
<td>1,867</td>
<td>1,746</td>
</tr>
<tr>
<td>VCER</td>
<td>784</td>
<td>942</td>
<td>955</td>
<td>954</td>
<td>947</td>
</tr>
<tr>
<td>Sub Total</td>
<td>1,875</td>
<td>2,070</td>
<td>2,146</td>
<td>2,821</td>
<td>2,693</td>
</tr>
<tr>
<td><strong>② Load Management Tool</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling Storage</td>
<td>230</td>
<td>268</td>
<td>323</td>
<td>340</td>
<td>385</td>
</tr>
<tr>
<td>EE Vending Machine</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>DLC</td>
<td>421</td>
<td>768</td>
<td>1,040</td>
<td>1,320</td>
<td>1,286</td>
</tr>
<tr>
<td>Remote Control: Air conditioner</td>
<td>3</td>
<td>15</td>
<td>27</td>
<td>44</td>
<td>59</td>
</tr>
<tr>
<td>Sub Total</td>
<td>655</td>
<td>1,055</td>
<td>1,395</td>
<td>1,709</td>
<td>1,736</td>
</tr>
<tr>
<td><strong>③ Energy Efficiency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lamp</td>
<td>94</td>
<td>496</td>
<td>571</td>
<td>653</td>
<td>723</td>
</tr>
<tr>
<td>Inverter</td>
<td>5</td>
<td>12</td>
<td>54</td>
<td>69</td>
<td>114</td>
</tr>
<tr>
<td>Motor</td>
<td>0.8</td>
<td>3</td>
<td>9</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Sub Total</td>
<td>100</td>
<td>511</td>
<td>634</td>
<td>730</td>
<td>852</td>
</tr>
<tr>
<td><strong>④ Gas Air Conditioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>991</td>
<td>1,004</td>
<td>1,108</td>
<td>1,215</td>
<td>1,347</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>831</td>
<td>236</td>
<td>80</td>
<td>-</td>
<td>1,388</td>
</tr>
<tr>
<td>Total</td>
<td>3,461</td>
<td>3,872</td>
<td>4,255</td>
<td>5,155</td>
<td>6,669</td>
</tr>
</tbody>
</table>

1) SVPC = Summer Vacation Period Coordination rate program
2) VECR = Voluntary Energy Conservation Rate Program
3) The values in ②, ③, ④ are accumulative total.
4) The actual amount of ‘Emergency Load Reduction’ & ‘DLC’ is not an executed value but a contracted one.

### 2.3. Target in the Resource Plan

Government reflects the performance of DSM to electricity demand/supply planning made every 2 years. That is, the government overviews performance by programs first and it applies to
baseline demand forecast and maximum demand is determined by reflecting the performance of DSM.

Target of DSM varies at every planning and shows a trend that the ratio of DSM relative to system maximum load is continuously increasing. For example, 5th long-term power development plan established in 2000 had 5 new DSM programs and expanded energy efficiency programs, It targeted 7,430MW of peak reduction compared to 6,460MW in 1998.

Table 4. Target of DSM in Korea

<table>
<thead>
<tr>
<th>Long Term Power Plan</th>
<th>Peak Load (MW) Before DSM</th>
<th>After DSM</th>
<th>DSM Target (MW)</th>
<th>DSM Performance Rate (%)</th>
<th>Target Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Plan ('91)</td>
<td>-</td>
<td>48,155</td>
<td>1,930</td>
<td>3.4</td>
<td>2006</td>
</tr>
<tr>
<td>3rd Plan ('95)</td>
<td>70,852</td>
<td>65,642</td>
<td>5,210</td>
<td>7.4</td>
<td>2010</td>
</tr>
<tr>
<td>4th Plan ('98)</td>
<td>76,036</td>
<td>69,572</td>
<td>6,460</td>
<td>8.5</td>
<td>2015</td>
</tr>
<tr>
<td>5th Plan ('99)</td>
<td>74,939</td>
<td>67,509</td>
<td>7,430</td>
<td>9.9</td>
<td>2015</td>
</tr>
<tr>
<td>1st BPE ('02)</td>
<td>74,784</td>
<td>67,745</td>
<td>7,039</td>
<td>9.4</td>
<td>2015</td>
</tr>
<tr>
<td>2nd BPE ('04)</td>
<td>79,266</td>
<td>68,737</td>
<td>10,529</td>
<td>13.2</td>
<td>2017</td>
</tr>
<tr>
<td>3rd BPE ('06)</td>
<td>83,424</td>
<td>71,809</td>
<td>11,615</td>
<td>13.9</td>
<td>2020</td>
</tr>
</tbody>
</table>

※ BPE = Basic Plan of Long Term Electricity Supply & Demand

In 2006, the 3rd Basic plan of long-term electricity supply & demand was established. In the target year 2020, the accumulated amount of DSM programs is 11,615MW, which is 13.9% of projected peak load.

3. Program Potential Projection

3.1 Basic Approach

Under the regulated circumstances, the basic direction for DSM target is oriented to long term feasibility considering maximum potential. Especially focusing on peak load reduction assigned in utility as a business performance index. In this study, we first reviewed past performance and trend, and then make trajectory curve using time series factor including extrapolation.

Generally, peak load programs are annually scheduled by utilities or government, considering achievable potential for measures, growth rate of peak demand, and the limitation of budget. In Korea, SVPC(summer vacation period coordination rate program) and VECR(voluntary energy conservation rate program) are implemented as typical peak load programs. Targets of these programs are scheduled respectively.

The first option to find the target or regional potential is an incremental approach. The target of some program in t year is calculated by the previous target in t-1 year and the growth rate of peak demand, as follows.

$$DSM_t = DSM_{t-1} \times (1 + \frac{(PL_t - PL_{t-1})}{PL_{t-1}})$$

Where $DSM_t$, $PL_t$ are the DSM target and the peak demand in t year respectively.

The second option is to use a trend analysis technique, by assuming the future trend would be determined by the past. Target during planning periods is estimated by extrapolation technique based on quadratic polynomial expression with 5 or 6 year recordings. The third option takes into account the
market share of measures. The some portion of existing market is substituted to the new measures with policy makers’ decision and effort. For example, the market share of high efficiency vending machine increased to 30% in target year or yearly base.

These options could be applied respectively to the program considering the nature of program and the amount of achievable potential.

3.2 Projection Algorithm

This paper suggest to approach analyze on demand resource assessment by end-use and identify achievable load potential by measures before implementation. The peak demand by end-use is calculated by estimated peak pattern and demand energy forecast.

\[
\text{Peak } kW_i = \text{August Sales}_j \times \frac{\text{August Peak Use}_{i,s}}{\text{Total August Use}_{i,s}} \quad (2)
\]

\[
\text{August Peak Use}_i = \text{Weekday Peak Hour Fraction}_i \times \text{Weekday Total Energy Use}_i \quad (3)
\]

\[
\text{Total August Use}_i = \sum_j \text{Number of Days}_i \times \text{Daily Use}_{i,j} \quad (4)
\]

\[
\text{Calibrated Peak } kW_i = \text{Peak } kW_j \times \frac{\text{Actual Peak } kW}{\sum_i \text{Peak } kW_i} \quad (5)
\]

And we estimate program potential during peak load period load for the customer by several end-use like HVAC, lighting, motor, inverter, pump etc. And then we forecast DSM resource by suggesting methodologies by program during horizon years. Finally, we suggest the implementation process and DSM goal setting mechanisms considering program portfolio and cost effectiveness under constraints like supply option, budget etc.

For estimate program potential by appliance and technology, we use Bass diffusion model as follows;

\[
\frac{f(t)}{1-F(t)} = p + qF(t) \quad (6)
\]

Where parameter \( p \) is the coefficient of innovation, \( q \) is coefficient of imitation, \( f(t) \) is the probability of adoption at time \( t \), and \( F(t) \) is the accumulated probability of adoption at time \( t \).

Demand \( n(t) \) and accumulated demand \( N(t) \) are formulated with previous diffusion model and market potential \( m \), as follows.

\[
N(t) = m \frac{1-e^{-(p+q)t}}{1+\frac{q}{p} e^{-(p+q)t}} \quad \& \quad n(t) = m \frac{p(p+q)^2 e^{-(p+q)t}}{(p+qe^{-(p+q)t})^2} \quad (7)
\]

Ultimately, we have to determine three unknown parameters, \( m, p, q \). These parameters may solved using a market survey, political decision, analytical solve method with recordings for some years.
4. Simulation

4.1 Load management Program

In this paper, we simulated two load programs – SVPC, VECR - in Korea. The target of SVPC, peak load reduction by adjusting vacation or maintenance schedules, is determined by using load shape data. The annual target is estimated by load shape data of Korea in 2003. Table 5 shows the simulated target for SVPC from 2006 to 2020.

Table 5. Targets for Load Program

<table>
<thead>
<tr>
<th>Year</th>
<th>SVPC</th>
<th>VECR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ind.</td>
<td>Biz.</td>
</tr>
<tr>
<td>2006</td>
<td>1,303</td>
<td>52</td>
</tr>
<tr>
<td>2007</td>
<td>1,352</td>
<td>57</td>
</tr>
<tr>
<td>2008</td>
<td>1,445</td>
<td>62</td>
</tr>
<tr>
<td>2009</td>
<td>1,488</td>
<td>671</td>
</tr>
<tr>
<td>2010</td>
<td>1,531</td>
<td>77</td>
</tr>
<tr>
<td>2011</td>
<td>1,572</td>
<td>82</td>
</tr>
<tr>
<td>2012</td>
<td>1,572</td>
<td>87</td>
</tr>
<tr>
<td>2013</td>
<td>1,611</td>
<td>93</td>
</tr>
<tr>
<td>2014</td>
<td>1,651</td>
<td>99</td>
</tr>
<tr>
<td>2015</td>
<td>1,692</td>
<td>104</td>
</tr>
<tr>
<td>2016</td>
<td>1,731</td>
<td>104</td>
</tr>
<tr>
<td>2017</td>
<td>1,771</td>
<td>110</td>
</tr>
<tr>
<td>2018</td>
<td>1,811</td>
<td>114</td>
</tr>
<tr>
<td>2019</td>
<td>1,852</td>
<td>119</td>
</tr>
<tr>
<td>2020</td>
<td>1,894</td>
<td>123</td>
</tr>
</tbody>
</table>

In the target year 2020, target for SVPC is 2,018MW, 17.4% of total DSM reduction 11,615MW. The target of VECR, average load reduction during summer afternoon peak hours, is estimated by load shape data of Korea in 2003. Results for planning years are shown in Table 6. In 2020, the target amount of VECR is 1,425MW and the industrial sector account for 95% of the target amount.

4.2 Energy Efficiency Program

In this paper, three energy efficiency programs - high efficiency lighting, inverters for improving motor efficiency, and high efficiency motor – are simulated for the scheduled target of those measures during the planning period(2006–2020). The estimated parameters by programs are as shown in table 6. And Figure 3 to Figure 5 is shown the forecast result of each program by measures.

Table 6. Results of parameter for Bass model

<table>
<thead>
<tr>
<th>High Efficiency Programs</th>
<th>Market Potential</th>
<th>Coefficient of Innovation</th>
<th>Coefficient of Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Ballast (32W)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-unit set</td>
<td>70,319,369</td>
<td>0.01471</td>
<td>0.12814</td>
</tr>
<tr>
<td>2-unit set</td>
<td>402,089,43</td>
<td>0.0097</td>
<td>0.12059</td>
</tr>
<tr>
<td>Energy efficient compact fluorescents</td>
<td>15,569,843</td>
<td>0.0351</td>
<td>0.05528</td>
</tr>
<tr>
<td>Inverter 50Hz</td>
<td>251,239</td>
<td>0.007574</td>
<td>0.27405</td>
</tr>
<tr>
<td>55Hz</td>
<td>13,387,093</td>
<td>0.000149</td>
<td>0.12172</td>
</tr>
<tr>
<td>Motor Medium/Large</td>
<td>520,588</td>
<td>0.00596</td>
<td>0.23248</td>
</tr>
<tr>
<td>Small</td>
<td>2,521,535</td>
<td>0.01429</td>
<td>0.26886</td>
</tr>
</tbody>
</table>
Table 7. DSM Target by programs (2006 – 2020)

<table>
<thead>
<tr>
<th>Year</th>
<th>SVPC</th>
<th>VECR</th>
<th>sum</th>
<th>Lighting</th>
<th>Motor</th>
<th>Inverter</th>
<th>sum</th>
<th>Total</th>
<th>System Peak Demand</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1,355</td>
<td>919</td>
<td>2,274</td>
<td>80</td>
<td>13</td>
<td>40</td>
<td>133</td>
<td>2,407</td>
<td>58,990</td>
<td>4.1%</td>
</tr>
<tr>
<td>2007</td>
<td>1,408</td>
<td>959</td>
<td>2,367</td>
<td>163</td>
<td>29</td>
<td>87</td>
<td>280</td>
<td>2,646</td>
<td>59,680</td>
<td>4.4%</td>
</tr>
<tr>
<td>2008</td>
<td>1,461</td>
<td>998</td>
<td>2,459</td>
<td>248</td>
<td>49</td>
<td>145</td>
<td>441</td>
<td>2,901</td>
<td>61,390</td>
<td>4.7%</td>
</tr>
<tr>
<td>2009</td>
<td>1,511</td>
<td>1,035</td>
<td>2,546</td>
<td>333</td>
<td>73</td>
<td>214</td>
<td>620</td>
<td>3,166</td>
<td>62,990</td>
<td>5.0%</td>
</tr>
<tr>
<td>2010</td>
<td>1,560</td>
<td>1,072</td>
<td>2,632</td>
<td>419</td>
<td>102</td>
<td>296</td>
<td>816</td>
<td>3,448</td>
<td>64,610</td>
<td>5.3%</td>
</tr>
<tr>
<td>2011</td>
<td>1,608</td>
<td>1,107</td>
<td>2,715</td>
<td>504</td>
<td>136</td>
<td>393</td>
<td>1,033</td>
<td>3,748</td>
<td>65,940</td>
<td>5.7%</td>
</tr>
<tr>
<td>2012</td>
<td>1,654</td>
<td>1,143</td>
<td>2,797</td>
<td>587</td>
<td>177</td>
<td>505</td>
<td>1,269</td>
<td>4,066</td>
<td>67,120</td>
<td>6.1%</td>
</tr>
<tr>
<td>2013</td>
<td>1,699</td>
<td>1,177</td>
<td>2,875</td>
<td>669</td>
<td>223</td>
<td>634</td>
<td>1,526</td>
<td>4,401</td>
<td>68,090</td>
<td>6.5%</td>
</tr>
<tr>
<td>2014</td>
<td>1,744</td>
<td>1,211</td>
<td>2,956</td>
<td>747</td>
<td>276</td>
<td>779</td>
<td>1,802</td>
<td>4,758</td>
<td>68,830</td>
<td>6.9%</td>
</tr>
<tr>
<td>2015</td>
<td>1,791</td>
<td>1,247</td>
<td>3,038</td>
<td>822</td>
<td>334</td>
<td>938</td>
<td>2,094</td>
<td>5,133</td>
<td>69,470</td>
<td>7.4%</td>
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<td>2016</td>
<td>1,836</td>
<td>1,282</td>
<td>3,118</td>
<td>893</td>
<td>396</td>
<td>1,109</td>
<td>2,398</td>
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<td>70,050</td>
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<tr>
<td>2017</td>
<td>1,880</td>
<td>1,316</td>
<td>3,197</td>
<td>960</td>
<td>461</td>
<td>1,287</td>
<td>2,708</td>
<td>5,904</td>
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<td>2018</td>
<td>1,925</td>
<td>1,352</td>
<td>3,277</td>
<td>1,022</td>
<td>525</td>
<td>1,469</td>
<td>3,016</td>
<td>6,293</td>
<td>71,030</td>
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</tr>
<tr>
<td>2019</td>
<td>1,971</td>
<td>1,389</td>
<td>3,360</td>
<td>1,079</td>
<td>588</td>
<td>1,649</td>
<td>3,316</td>
<td>6,676</td>
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<tr>
<td>2020</td>
<td>2,018</td>
<td>1,426</td>
<td>3,444</td>
<td>1,132</td>
<td>647</td>
<td>1,824</td>
<td>3,603</td>
<td>7,047</td>
<td>71,810</td>
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</table>

Figure 3. Target for Inverter

Figure 4. Target for Lighting

Figure 5. Target for High efficiency Motor
5. Conclusion

In Korea, long-term power development plan is very important as a resource adequacy target and energy balance in the nation. Especially the target after DSM is critical to determine total amount of capacity and technology selection. In this paper we suggest the way to analyze peak reduction and provide the results. The long-term peak reduction target and forecasting approach in the major programs would be measured and testified objectively through this study.

SVPC and VECR are very unique and flexible load programs in terms of their performance even though their peak reduction targets reach 70% of total DSM amount. Besides the specific data of energy efficiency measures is highly variable from application to application and was not available. Therefore the availability of data is the most significant factor for the detailed analysis of the future.

Reference