Development of benchmarks for quotas allocation

Botagoz Akhmetova
JSC “Zhasyl Damu”
Ministry of Energy
Kazakhstan
Grandfathering was applied during the period of 2013-2015 in the Republic of Kazakhstan in order to allocate quotas for greenhouse gas emissions.

Sectors of the economy covered by the ETS are the following: energy, coal mining, oil and gas, and industry. Quotas are allocated for the plants having $\text{CO}_2$ emissions of more than 20 000 tons per year.
Determine the object of comparative evaluation

Determine competitors on products manufactured

Collection of data

Analysis and calculation of obtained data

Benchmark (BM) = (t CO₂)/t of Product
46 companies, 117 installations are subject to quota allocation in the energy sector.

Based on the data from energy companies, benchmarks were calculated. According to the obtained calculations (total volume of CO2 emissions when generating electricity divided by the total volume of electricity produced for the period of 2013-2015, and similar calculations are provided for heat benchmark), there were four benchmarks of GHG emissions identified, depending on the fuel consumed.

The following 4 BMs were introduced for the energy sector:

1\textsuperscript{st} category - plants operating on coal:
Electricity BM = 0,986 kg CO\textsubscript{2}/kW-hr
Heat BM = 0,484 tCO\textsubscript{2}/Gcal

2\textsuperscript{nd} category - plants operating on gas:
Electricity BM = 0,622 kg CO\textsubscript{2}/kW-hr
Heat BM = 0,312 tCO\textsubscript{2}/Gcal
The example to calculate BM in the industrial sector is provided for cement producing companies.

Based on the data from 10 companies producing cement (clinker), the total volume of CO₂ emissions and the total volume of product made (clinker) for the period of 2013-2015 were calculated.

\[
\frac{18 \, 030 \, 909,19 \text{ tons of CO}_2}{18 \, 688 \, 043,80 \text{ tons}} = 0,965 \text{ tCO}_2/\text{tons}
\]

\[
BM = 0,965 \text{ tCO}_2/\text{t of clinker}
\]
36 companies, 51 installations are subject to quota allocation in the oil and gas sector.

The example to calculate BM in oil and gas sector is provided for oil and gas extracting companies.

Based on the data from companies extracting oil and gas, the total volume of CO₂ and the total volume of product made (oil/gas) for the period of 2013-2015 were calculated.

\[
\frac{22\ 058\ 890,31\ \text{tons CO}_2}{339\ 185\ 592,39\ \text{tons (oil and gas)}} = 0,065\ \text{tCO}_2/\text{t}
\]

BM for oil and gas extraction = 0,065 tCO₂/t
Enterprises engaged in processing oil and gas produce different types of products: motor gasoline, diesel fuel etc. Oil and gas refining is a complex process that consists of multiple processes connected together. To estimate benchmarks for oil refineries, it was decided to calculate single coefficient for all oil products, standing out oil coke and industrial sulfur as a separate group.

According to the calculations (total volume of CO₂ is divided by the total volume of oil products produced), it was found that BM for oil products had amounted to \( 0.18 \text{ tCO}_2/\text{t} \); BM for oil coke - \( 0.69 \text{ tCO}_2/\text{t} \); and BM for industrial sulfur when processing oil is \( 0.24 \text{ tCO}_2/\text{t} \).
### Calculation of Quotas Using BM or Grandfathering for the Industrial Sector for 2018-2020 (Examples)

<table>
<thead>
<tr>
<th>No.</th>
<th>Company</th>
<th>Quota under BM method for the period of 2018-2020, tons CO₂</th>
<th>Deficit under BM method for the period of 2018-2020, tons CO₂</th>
<th>Quota under grandfathering method for the period of 2018-2020, tons CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Company A</td>
<td>3 005 657,14</td>
<td>- 325 528,75</td>
<td>3 331 185,89</td>
</tr>
<tr>
<td>2</td>
<td>Company B</td>
<td>2 148 802,31</td>
<td>- 168 263,56</td>
<td>2 317 065,87</td>
</tr>
<tr>
<td>3</td>
<td>Company C</td>
<td>6 213 186,29</td>
<td>- 7 946 120,91</td>
<td>14 159 307,20</td>
</tr>
</tbody>
</table>

When applying grandfathering, these companies get the full quota according to the average value of their greenhouse gas emissions for the period of 2013-2015.
# Calculation of Quotas Using BM or Grandfathering for the Oil and Gas Sector for 2018-2020 (Examples)

<table>
<thead>
<tr>
<th>No.</th>
<th>Company</th>
<th>Quota under BM for the period of 2018-2020, tons CO₂</th>
<th>Deficit under BM method for the period of 2018-2020, tons CO₂</th>
<th>Quota under grandfathering for the period of 2018-2020, tons CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Company A</td>
<td>540 626,10</td>
<td>- 391 335,17</td>
<td>931 961,27</td>
</tr>
<tr>
<td>2</td>
<td>Company B</td>
<td>254 131,01</td>
<td>- 374 553,29</td>
<td>628 684,30</td>
</tr>
<tr>
<td>3</td>
<td>Company C</td>
<td>411 132,62</td>
<td>- 1 189 541,68</td>
<td>1 600 674,30</td>
</tr>
</tbody>
</table>

When applying grandfathering, these companies get the full quota according to the average value of their greenhouse gas emissions for the period of 2013-2015.
Thank you for your attention!