

## Mexico

In Mexico, the Law to Prevent and Control Environmental Pollution was first promulgated in early 1970s. Since 1982, Mexican Constitution was amended to create new institutions and to clarify the legal and administrative policy for environmental protection. In the same year the Federal Law on Environmental Protection was enacted. The Ministry of Environment, Natural Resources and Fisheries (SEMARNAP) was created in Dec 1994 and changed its name to Secretary of Environment and Natural Resources (SEMARNAT) in Nov 2000. The responsibilities of SEMARNAT include formulating, implementing, evaluating and disseminating policies and guidelines for environmental protection and sustainable use of natural resources, and promoting and monitoring compliance with environmental laws. The emission standards for air pollutants from combustion plants (NOM-085-ECOL-1994) were set and came into force from 2 Dec 1994, and the standards were amended in Nov 1997. The emission limit values vary according to the region a plant is located. The standards are more stringent in highly populated areas like Mexico City.

1. Emission standards for existing coal-fired combustion plants (plants installed, planned, approved or began operation before 2 Dec 1994), applicable until 31 Dec 1997:

***Emission limit values for combustion plant with capacity larger than 110,000 MJ/h***

| pollutant          | regional emission limit value, mg/m <sup>3</sup><br>(equivalent to limit value in unit kg/10 <sup>6</sup> kcal) |                  |                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------|------------------|-----------------|
|                    | ZMCM                                                                                                            | ZC               | RP              |
| particulate matter | 70                                                                                                              | 325              | 435             |
|                    | -0.105                                                                                                          | -0.436           | -0.664          |
| SO <sub>2</sub>    | 3146 (1100 ppm)                                                                                                 | 6006 (2100 ppm)* | 7436 (2600 ppm) |
|                    | -4.32                                                                                                           | (8.24)*          | -9.81           |
| NO <sub>x</sub>    | 328 (160 ppm)                                                                                                   | 574 (280 ppm)**  | 820 (400 ppm)   |
|                    | -0.443                                                                                                          | (0.785)**        | -1.122          |

\* for the purpose of fulfilling the limits of sulfur dioxide, the industrial corridor Tampico - Madero-Altamira in the state of Tamaulipas must comply with the values set for the rest of country.

\*\* these values apply to the Metropolitan Area of Monterrey and Guadalajara and Cities, Tijuana, Baja California and Mexico, Juarez, Chihuahua.

2. Emission standards from 1 Jan 1998

**Emission limit values for combustion plant with capacity larger than 110,000 MJ/h**

| pollutant          | regional emission limit value, mg/m <sup>3</sup><br>(equivalent to limit value in unit kg/10 <sup>6</sup> kcal) |                 |                  |
|--------------------|-----------------------------------------------------------------------------------------------------------------|-----------------|------------------|
|                    | ZMCM                                                                                                            | ZC*             | RP               |
| particulate matter | 60                                                                                                              | 250             | 350              |
|                    | -0.09                                                                                                           | -0.375          | -0.525           |
| SO <sub>2</sub>    | 1573 (550 ppm)                                                                                                  | 3146 (1100 ppm) | 6292 (2200 ppm)  |
|                    | -2.16                                                                                                           | -4.31           | -8.16            |
| NO <sub>x</sub>    | 225.5 (110 ppm)                                                                                                 | 225.5 (110 ppm) | 768.75 (375 ppm) |
|                    | -0.303                                                                                                          | -0.303          | -1.052           |

\* for NO<sub>x</sub> emissions control, the Critical Zone refers only to metropolitan areas in the cities of Monterrey and Guadalajara and the cities of Tijuana, Baja California and Mexico, Juarez, Chihuahua.

Note: 1. For facilities burning mixed fuels, if a mixture of gaseous and solid fuels is used, emission limit values for solid fuel combustion shall apply. If a mixture of solid and liquid fuels is used, the emission values for liquid fuel combustion shall apply. If a mixture of gaseous, liquid and solid fuels is used, the emission values for liquid fuel combustion shall apply.

2. The above emission limit values are expressed at 25 °C, 101.325 kPa and dry flue gas basis with 5% of O<sub>2</sub> in flue gas.

3. The abbreviations for regions stand for:

|      |                                  |
|------|----------------------------------|
| ZMCM | Metropolitan Area of Mexico City |
| ZC   | critical areas                   |
| RP   | rest of the country              |

ZMCM comprises the 16 political delegations of the Federal District and the following 17 municipalities of the State of Mexico: Zaragoza Bangalore, Chennai, Dehra Romero Rubio, Hamilton, Chalco de Covarrubias, Chimalhuacan, Ecatepec, Huixquilucan, Ixtapaluca, The Paz, Naucalpan de Juarez, Nezahualc6yotl, San Vicente Chicoloapan, Nicolas Romero, Tec6mac, Tlalnepantla and Tultitl6n.

Critical areas (ZC) includes metropolitan areas of Monterrey and Guadalajara, the populated areas: Coatzacoalcos, Minatitlan (municipalities of Coatzacoalcos, Minatitlan, the southeast of Ixhuatl6n, Cosoleacaque and Nanchital) in the state of Veracruz; Celaya; Irapuato - Salamanca (municipalities of Celaya, Irapuato, Salamanca and Villagr6n) in the

state of Guanajuato; Tula-Vito-Asasco (municipalities of Tula de Allende, Tepeji de Ocampo, Tlahuelilpan, Atitalaquia, Atotonilco of Tula, Tlaxoapan and Apaxco) in the states of Hidalgo and Mexico; industrial corridor Tampico-Madero-Altamira (municipalities of Tampico, Altamira and Cd. Madero) in the state of Tamaulipas; the Municipality of Tijuana in Baja California state; and the Municipality of Cd. Juarez in the state of Chihuahua.

4. Combustion facilities with capacity greater than 43,000 MJ/h. should support the scheme of total transferable SO<sub>2</sub> emission allowances that are allocated based on regional levels given in the following table and should not exceed emission limit values established in Section 2.

| region                           | SO <sub>2</sub> emission level, kg/10 <sup>6</sup> kcal |
|----------------------------------|---------------------------------------------------------|
| Metropolitan Area of Mexico City | 0.36                                                    |
| critical areas                   | 1.44                                                    |

In critical areas if there is no availability of fuels that meet the ecological quality standards set out by the respective official, the National Institute of Ecology, after consultation with the National Advisory Committee for Standardization for Environmental Protection, suspend the implementation of the emission limit values set in the above table and in Section 2 with respect to SO<sub>2</sub> and particulate matter, and apply the values outlined in Section 1.

3. Emission standards for particulate matter emissions from stationary sources (NOM-043-ECOL-1993, from 7 Oct 1993)

**Emission limit values for particulate matter from stationary sources**

| gas flow rate, m <sup>3</sup> /min. | emission limit value, mg/m <sup>3</sup> |                     |
|-------------------------------------|-----------------------------------------|---------------------|
|                                     | critical areas*                         | rest of the country |
| 5                                   | 1536                                    | 2304                |
| 10                                  | 1148                                    | 1722                |
| 20                                  | 858                                     | 1287                |
| 30                                  | 724                                     | 1086                |
| 40                                  | 641                                     | 962                 |
| 50                                  | 584                                     | 876                 |
| 60                                  | 541                                     | 811                 |
| 80                                  | 479                                     | 719                 |
| 100                                 | 439                                     | 655                 |
| 200                                 | 326                                     | 489                 |
| 500                                 | 222                                     | 333                 |
| 800                                 | 182                                     | 273                 |
| 1000                                | 166                                     | 249                 |
| 3000                                | 105                                     | 157                 |
| 5000                                | 84                                      | 127                 |
| 8000                                | 69                                      | 104                 |
| 10000                               | 63                                      | 95                  |
| 20000                               | 47                                      | 71                  |
| 30000                               | 40                                      | 60                  |
| 50000                               | 32                                      | 48                  |

\* critical areas include: Metropolitan Area of Mexico City, Monterrey and Guadalajara, population centres of Coatzacoalcos-Minatitlan, State of Veracruz, Celaya, Irapuato, Salamanca, State of Guanajuato, Tula-Vito-Aspasco, states of Hidalgo and Mexico, Industrial Corridor Tampico - Madero-Altamira, Tamaulipas State and the northern border area.

Note: The above figures are expressed at 25 °C, 101.325 kPa and dry flue gas basis.