Health and Air Pollution

Air Pollution – Challenges and Solutions

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Tehran at glance

- Nineteenth largest city in the world
- Population of about 12 million people per day
- 20% of the country's energy consumption
- Traveling more than 5 million vehicles
- Activity over 17 thousand industrial units

Special Geographical conditions (Topography, wind direction, …)
Air pollution Sources

Natural Sources: Desert lands around Tehran and outside of Iran

Human sources:  
- Mobile sources: 70-80%
  - private vehicles
  - Public vehicles
- State sources: 20-30%
  - Industries, factories, …
  - Residential, commercial ,…
Air Pollution Effects

Local effects:

- Effects on humans
  - Deaths from respiratory diseases
  - Other diseases such as heart disease, throat, eyes, blood disorders and cancer
  - Genetic disorders and transfer the impact to the next generation
  - Chronic fatigue
  - ....

- Impact on the environment
  - Vegetation damage
  - Reduce biodiversity
  - Damage to the soil
  - Corrosion
  - ....
Air Pollution Effects

Global effects:

- Increasing Greenhouse effect
- Global warming
- Climate change
- Acid rain
- ....
Tehran air pollution monitoring stations

Number of DOE stations: 17
Number of Municipality stations: 21
<table>
<thead>
<tr>
<th>Pollution Standard Index or (Air Quality Index)</th>
<th>clean (Number of days)</th>
<th>Healthy (Number of days)</th>
<th>Unhealthy (Number of days)</th>
<th>Very Unhealthy (Number of days)</th>
<th>Dangerous (Number of days)</th>
<th>Pollutant Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1382 (2003-2004)</td>
<td>11</td>
<td>191</td>
<td>161</td>
<td>2</td>
<td>0</td>
<td>Co</td>
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<tr>
<td>1383 (2004-2005)</td>
<td>20</td>
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<td>88</td>
<td>0</td>
<td>0</td>
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<tr>
<td>1384 (2005-2006)</td>
<td>23</td>
<td>253</td>
<td>89</td>
<td>0</td>
<td>0</td>
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<tr>
<td>1385 (2006-2007)</td>
<td>36</td>
<td>254</td>
<td>75</td>
<td>0</td>
<td>0</td>
<td>Co</td>
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<td>1386 (2007-2008)</td>
<td>22</td>
<td>328</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>Co</td>
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<td>1387 (2008-2009)</td>
<td>13</td>
<td>293</td>
<td>59</td>
<td>1</td>
<td>0</td>
<td>PM10</td>
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<td>1388 (2009-2010)</td>
<td>32</td>
<td>291</td>
<td>40</td>
<td>1</td>
<td>1</td>
<td>PM2.5</td>
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<tr>
<td>1389 (2010-2011)</td>
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<td>247</td>
<td>103</td>
<td>1</td>
<td>0</td>
<td>PM2.5</td>
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<tr>
<td>1390 (2011-2012)</td>
<td>3</td>
<td>144</td>
<td>215</td>
<td>3</td>
<td>0</td>
<td>PM2.5</td>
</tr>
<tr>
<td>1391 (2012-2013)</td>
<td>3</td>
<td>216</td>
<td>146</td>
<td>1</td>
<td>0</td>
<td>PM2.5</td>
</tr>
<tr>
<td>1392 (2013-2014)</td>
<td>4</td>
<td>201</td>
<td>160</td>
<td>0</td>
<td>0</td>
<td>PM2.5</td>
</tr>
<tr>
<td>1393 (2014-2015)</td>
<td>13</td>
<td>192</td>
<td>86</td>
<td>0</td>
<td>0</td>
<td>PM10, PM2.5</td>
</tr>
</tbody>
</table>
Municipality actions to reduce air pollution

- Increasing the share of trips using public transport to travel within the city (56%)
- Increase 215 km of bike paths network in Tehran (the share of bicycle in Tehran transportation is 0.4)
- Reducing the proportion of using private vehicles (37.5 %)
- Increasing the length of the highway network in Tehran to facilitate access (535 Km)
- Increasing the length of metro network (152.5 km)
- Increasing length of BRT (Bus Rapid Transit) network (122.9 km)
- Increase per capita urban green space in Tehran (15 m²)
- Development per capita green spaces around the city (green belt: 23 m²)
- Increasing the number of technical examination vehicles centers (17 centers)
- Development monitoring stations of air pollution in Tehran (21 stations)
- ....
Municipality actions to reduce air pollution

- equipped 365 Tehran municipality building to intelligent control system for heating
- Implementation of technical examination for 200 engine room in Tehran building
- Development of using new and renewable energy in buildings and public places in Tehran municipality
- Development of using renewable energy in buildings and public places in Tehran municipality (installed 500 solar water heater in public places, 4000 solar lights in park …)
- …
Challenges:

Management Challenges:

- Lack of integrated management
- Failure to allocate financial and funds resources required in organizations and …
- Lack of proper implementation of comprehensive plans for reducing air pollution
- Lack of coordination between ministries and organizations related to reducing air pollution
- Implementation of passive actions to deal with air pollution
- Weaknesses in the education and culture
- Lack of public participation programs to reduce air pollution
- Economic problems, including sanctions …
Challenges:

Technical Challenges:

mobile sources:

- Poor fuel quality
- Old technology vehicles
- High average age
- Not provide the use of pollution control technologies

State sources

- The high intensity of energy consumption
- Ancient technology in industry
- Poor fuel quality
Solutions:

Management solutions

- Integrated Management of Air Pollution
- Modification Air Quality Management Plan
- Continually monitor the implementation of laws enacted
- Allocation Resources and funds to implement programs to reduce air pollution by the government
- Proper supervision on the implementation of programs by supervisor
- Management of air pollution caused by fine particles out of Tehran
- Promote education and culture
- Public participation in order to reduce air pollution (citizens and NGOs)
- Implementing specific programs to Reduce air pollution during warning and emergency situations
- Decentralization
Solutions:

Technical solutions

- Improve the quality of fuel and vehicles
- Removal of old vehicles from the fleet
- Development of public transportation fleet in Tehran
- Expand the use of clean fuel vehicles
- Replacement catalytic converters in vehicles
- Expanding the use of electric vehicles and hybrid
- Elimination of air pollution caused by industries
- Implementation Technical examination engine room in all building
- Development of renewable energy use in buildings and public spaces
- Prevent Traveling old vehicles and Without tag technical examination
- Improving Vehicle inspection standard
- Development of green space
We look forward to having clean air and blue sky in Tehran.