



The Future Role of Gas- Post COP 21



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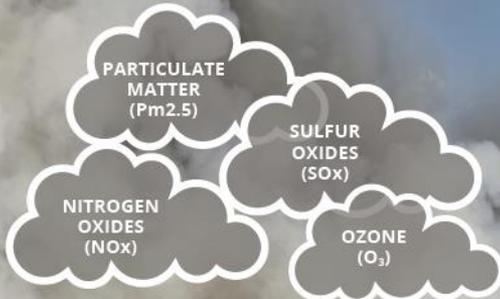
6th UNECE Gas Centre Industry Forum

Context: COP 21 and a spotlight on emissions



Natural Gas. An agent of change in the fight against urban air pollution

NATURAL GAS: IMPROVING THE AIR WE BREATHE



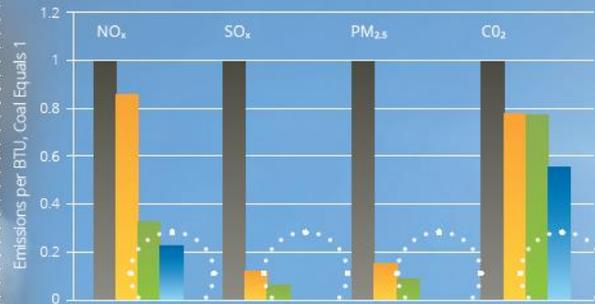
Outdoor air pollution is among the most significant environmental threats to human health:



Premature deaths each year (WHO)



Deaths from outdoor air pollution will double from current levels by 2050 absent policy changes (OECD)

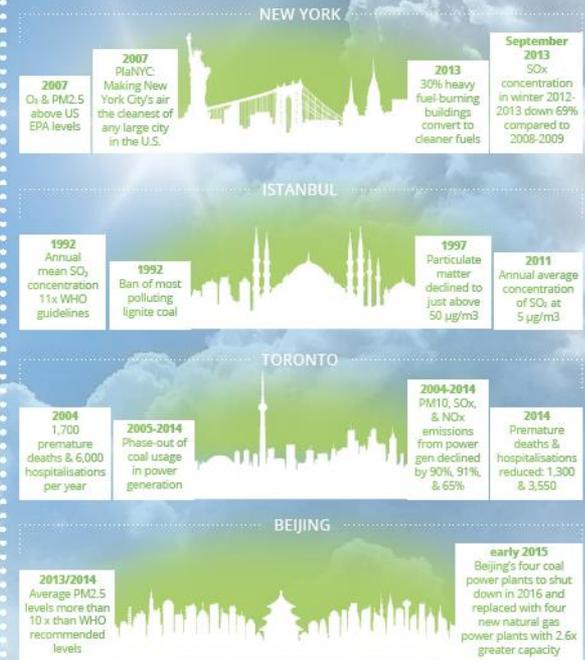


More natural gas = fewer pollutants and CO₂ emissions

SOURCE: EPA AP-42 Compilation of Air Pollutant Emission Factors; CenSARA Area Combustion Emissions Inventory Enhancement Project – Final Report 2011

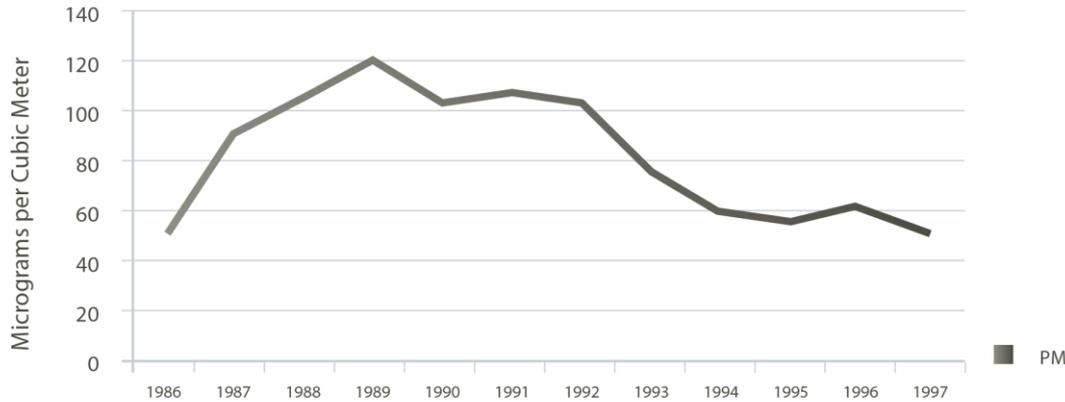


Four global mega cities are taking action



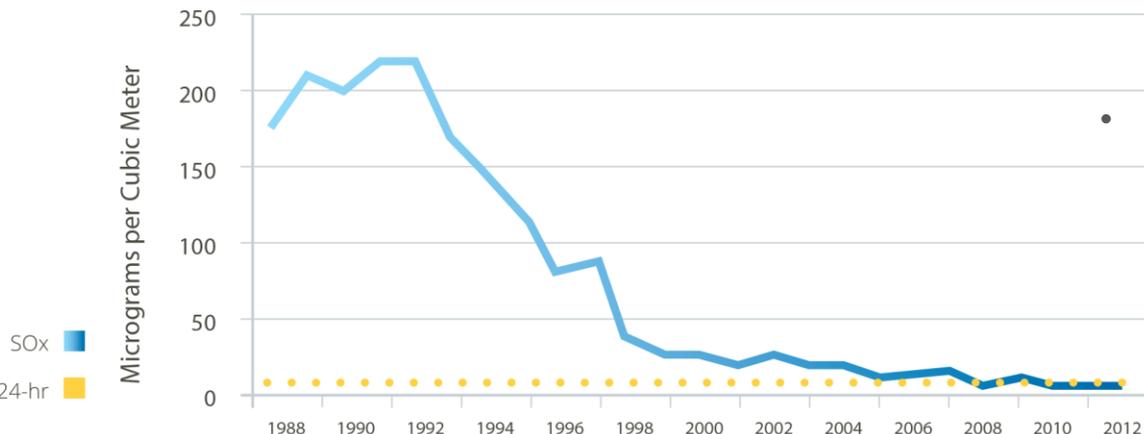
Case Study 1: Istanbul

Figure 3: Istanbul Annual Average Particulate Matter Concentrations 1986-1997



SOURCE: OECD Environmental Performance Reviews, Turkey 1999

Figure 4: Istanbul Annual Average SO₂ Concentrations 1988-2012

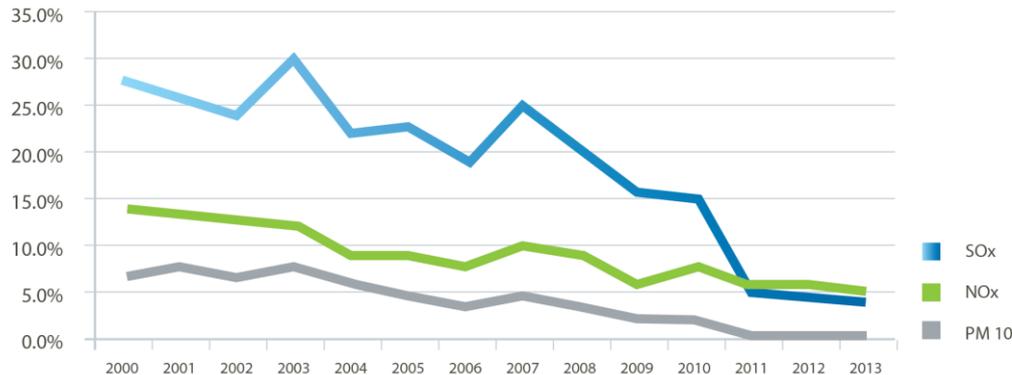


Source: IGDAS

- By the early 1990s Istanbul had become unliveable, due largely to burning of lignite
- Policy response was massive investment in gas distribution systems.
- As a result of the switch, particulate matter declined from over 100 micrograms per cubic meter in the early 1990s to just above 50 by 1997
- SO₂ concentrations also began an immediate decline in the early 1990s. By the end of the 1990's SO₂ had fallen nearly 90%

Case Study 2: Ontario / Toronto

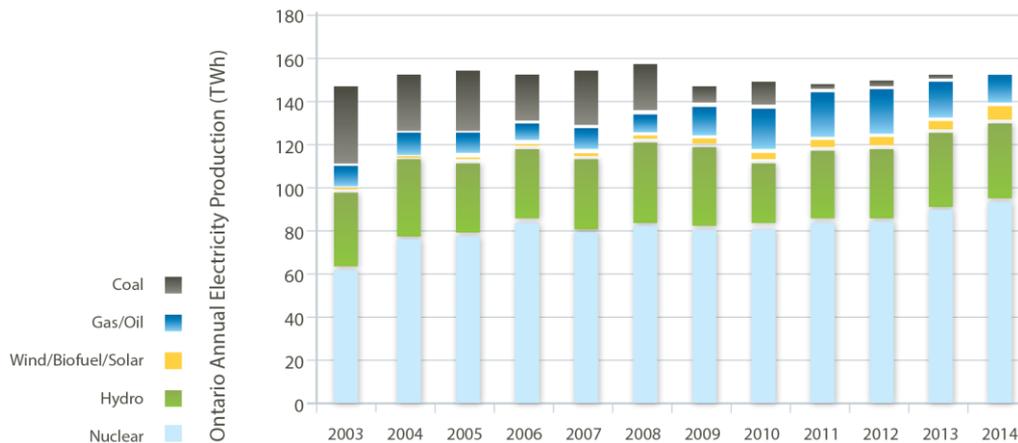
Figure 6: Emissions from Electricity Generation as a Percent of Total Ontario Emissions



SOURCE: Canada National Pollutant Report Inventory, Author's Analysis
(PM10 emissions exclude open sources such as road dust, agriculture, and construction)

- Landmark decision made to entirely phase out coal-fired power in 2004
- Largest population in North America to do so
- Before the switch to gas, air pollution in the city contributed to 1,700 premature deaths and 6,000 hospitalizations per year
- Switch to gas and removal of coal led to reduction in deaths and hospitalizations by 23% and 40% respectively
- Inherent flexibility of gas means that it works very well with wider mix: nuclear / renewables

Figure 5: Fuel Mix in Ontario's Electricity Sector 2003-2014



SOURCE: Ontario Independent Electricity System Operator; IISD

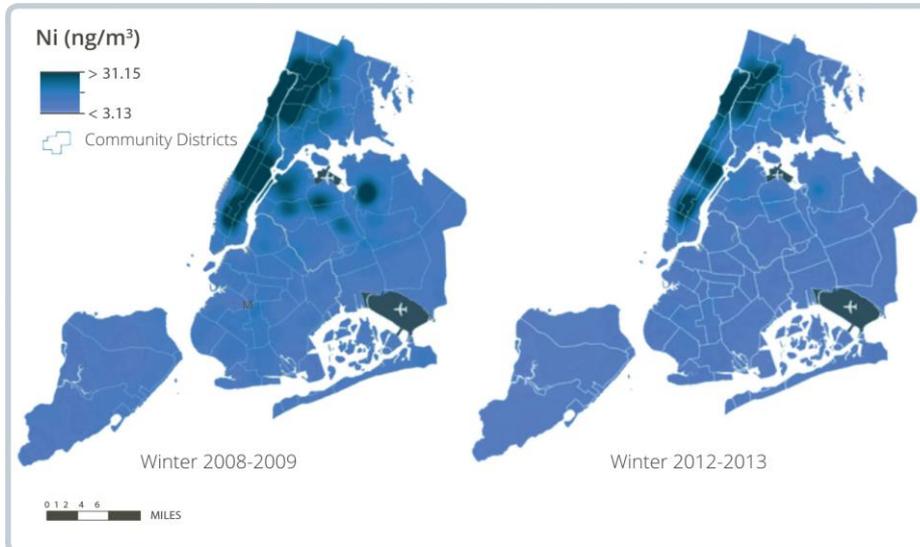
Case Study 3: New York

Table 2: Average Pounds of Pollutant-Forming Emissions per MWh for U.S. Coal and Natural Gas Power Plants, 2005

	Coal	Natural Gas
SO ₂	12	.045
NO ₂	4.1	2.3
PM _{2.5}	.59	.11
PM ₁₀	.72	.12

SOURCE: *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*, National Academies Press, 2010, Tables 2-11, 2-16.

Figure 2: Comparison of Estimated Nickel Concentrations in PM_{2.5}

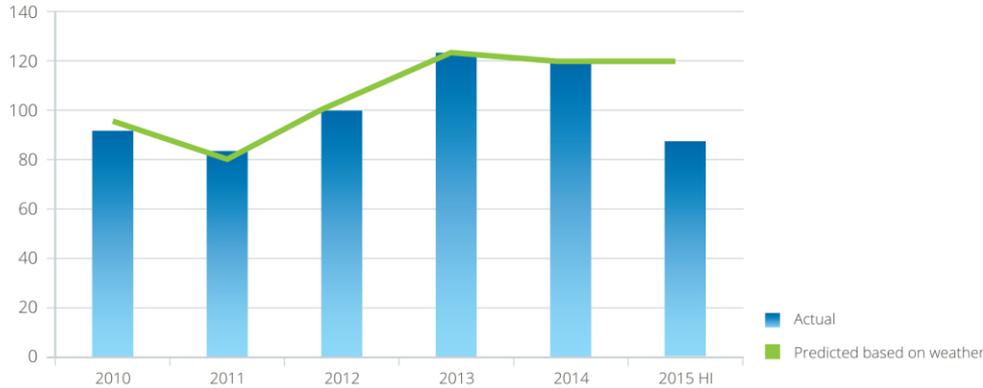


SOURCE: New York City Department of Health and Mental Hygiene

- In 2007, the levels of Ozone and PM_{2.5} exceeded US EPA standards. New policy enacted.
- 30% of heavy fuel-burning buildings in New York City converted to cleaner fuels. Approximately 75% of those that made the switch converted to natural gas or ultra-low sulfur No. 2 oil.
- SO_x concentrations decreased by 69% in four years; PM_{2.5} levels met EPA standards for the first time in 2014.
- 780 fewer deaths in the city and over 2,000 fewer emergency room visits each year.

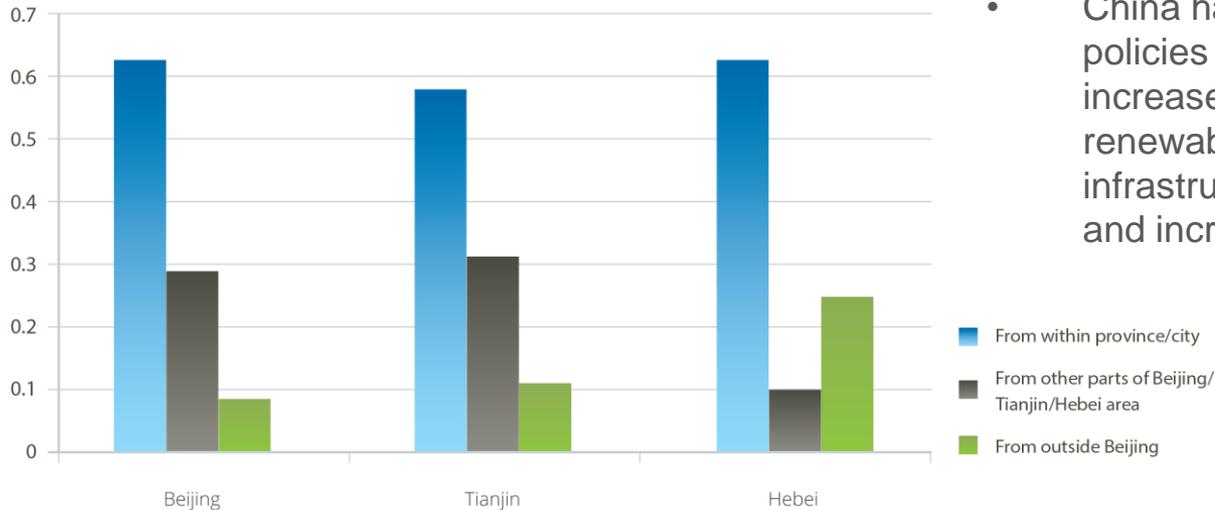
Case Study 4: Beijing

Figure 8: Beijing Actual PM2.5 Levels Compared to Predicted Levels Based on Weather



SOURCE: Greenpeace; Paulson Institute, "Beijing Blue Skies - Is This the New Normal?"

Figure 7: Origin of PM_{2.5} Pollution in Beijing/Tianjin/Hebei Area, 2010



SOURCE: Paulson Institute, *Climate Change, Air Quality and the Economy: Integrating Policy for China's Economic and Environmental Prosperity*

- The average PM2.5 levels in China's urban areas are often 6 times higher than WHO standards. In Beijing they are 10 times higher
- Approximately 50% of this air pollution burden is attributable to coal
- Regional co-ordination vital to protect Beijing
- China has adopted a variety of policies and goals to promote increased generation from renewables, increased supply and infrastructure to distribute natural gas, and increased nuclear generation

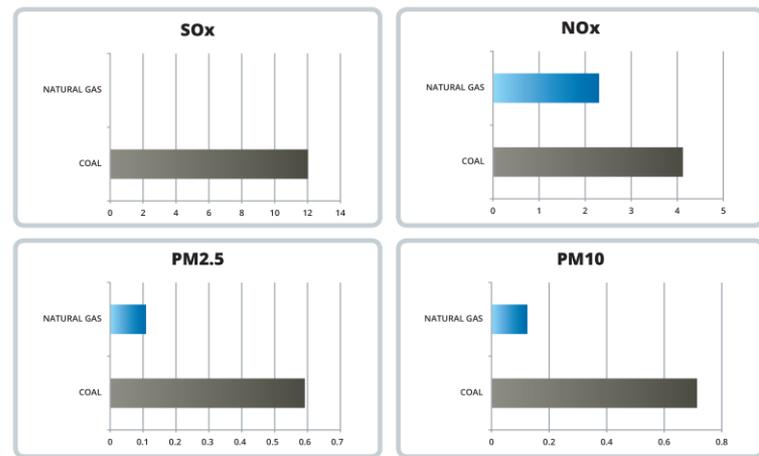
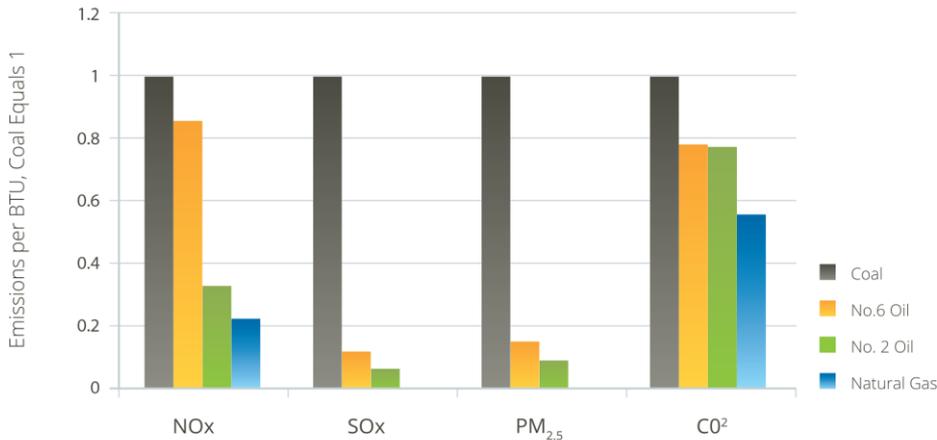
Conclusion: Gas as the positive change agent

Enhanced use of natural gas in energy generation, heating and industry will drastically reduce emissions, mercury and particulate matter, thereby providing enhanced quality of life for virtually everyone in urban society.

We support policies that reduce GHG emissions and emissions of health damaging air pollutants such as:

- Improvement of end-use energy efficiency
- Increases in combustion efficiency
- Encouragement of fuel switching
- Increased use of non –combustion renewable energies

Figure 1: Comparison of Emissions from Different Fuels



Average Pounds of Pollutant-Forming Emissions per MWh for U.S. Coal and Natural Gas Power Plants

Outreach related to the Urban Air Quality report

- Press release distributed via PR Newswire and published on 229 websites
- Press release generated more than 20 articles in key energy trade publications in English, French and Chinese
- Publication of article in FT.com and Financial Times - combined paid print and digital circulation of 750,000
- Digital amplification generates 2,449,490 impressions and 1,009 clicks through to IGU website and report reaching audiences in US, UK and India among others
- IGU Newsletter distributed to 1,200 industry stakeholders

- Report covered in key international energy trade publications (eight articles in total)
- Key messages of report covered in Mainland China energy- and environment focused media (15 articles)



Energy Information And Consulting
Service Provider



- Leader's statements were critical in setting the stage
- First major press conference before the Leader's statements was related to Fossil Fuel Subsidy Reform
- Many NGO's proclaimed this to be the end of the fossil fuel era
- Urban Air Quality was extensively covered by the media
- The agreement clearly signals the need to act

"IF WE UNITE OUR HIGHEST ASPIRATIONS, IF WE MAKE OUR BEST EFFORTS TO PROTECT THIS PLANET FOR FUTURE GENERATIONS, WE CAN SOLVE THIS PROBLEM."

PRESIDENT OBAMA
SEPTEMBER 2015



- Historic agreement reached sends a strong commitment signal on the transition of the energy systems
- Gas provides the fastest and most economic means of reducing carbon emissions and cleaning up the dirty and polluted Urban Air Quality
- Gas offers the necessary flexibility required to manage complex energy systems
- Although most of the focus is on electricity generation and transport, the role of gas plays as a feedstock fuel can not be forgotten
- Necessary policies need to be implemented to maximize the benefits that gas can make

Thank you