8th Session of the Group of Experts on Gas

Role of gas in attaining the Sustainable Development Goals: air quality case studies

25th March 2021

Luis Bertran Rafecas, Secretary General of the International Gas Union (IGU)

Trends: Keeping our activity on line

IGU publishes technical information and reports on key issues.

Featured Publications

World organizations:

World Bank
SE4ALL
G20
IEA
UNE
Methane Guiding Principles

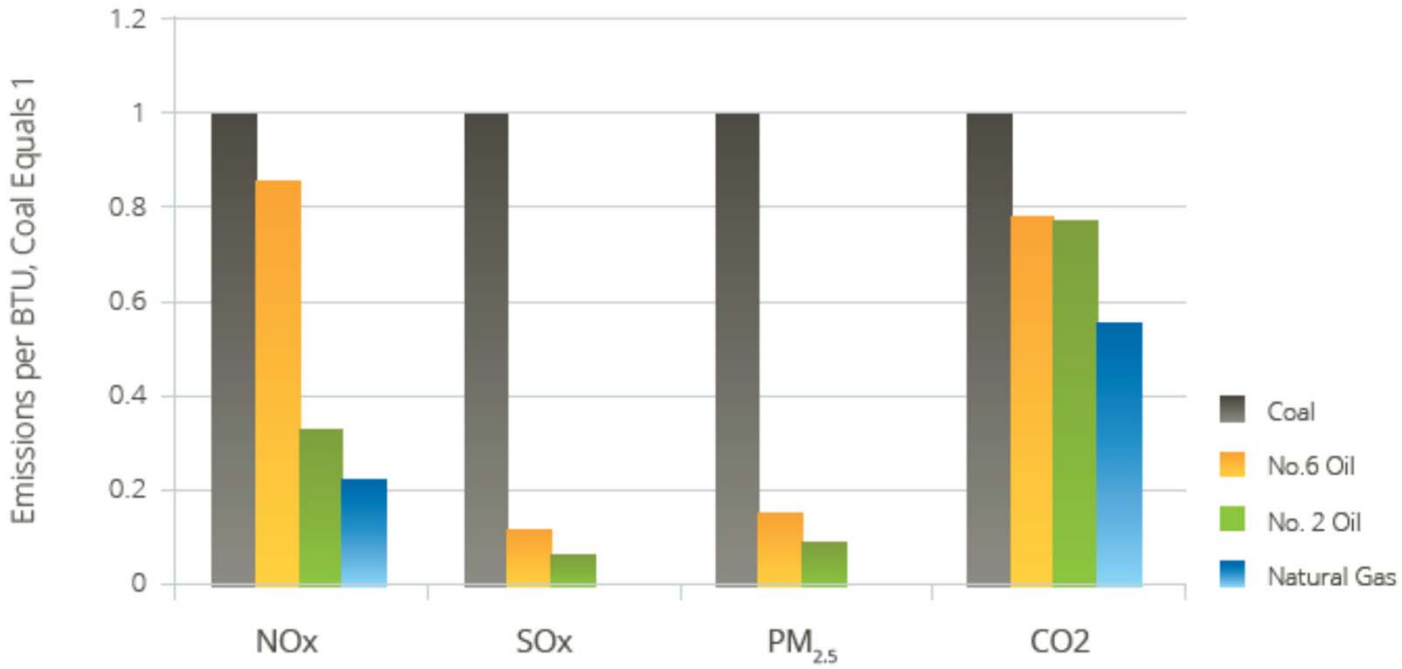
Regional organizations:

GasNaturally

LAGC

Natural Gas is the Cleanest Burning Hydrocarbon

Figure 1: Comparison of Emissions from Different Fuels



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

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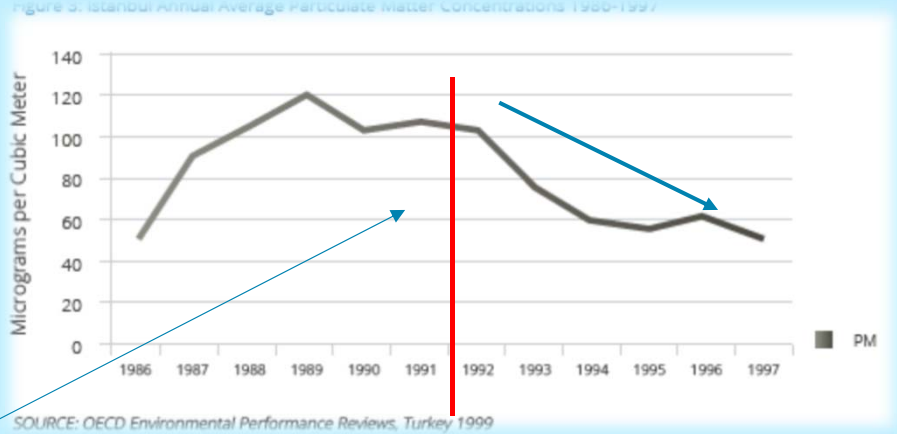
28th WORLD GAS CONFERENCE
DAEGU, KOREA 23-27 MAY

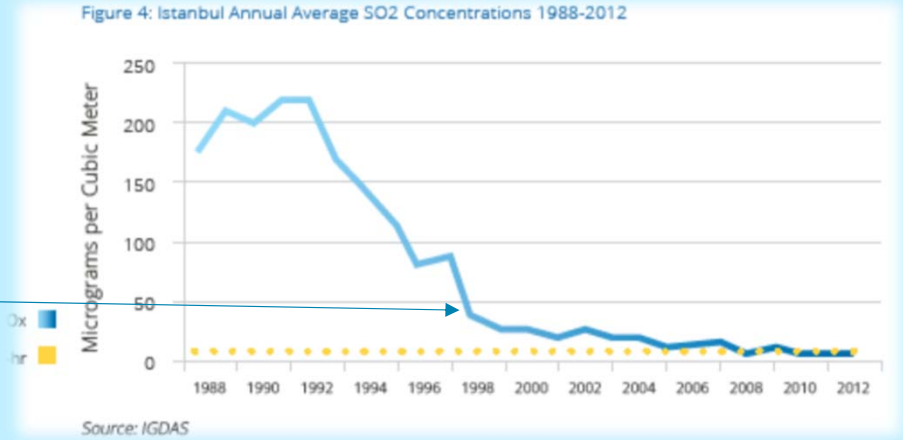
Istanbul Switched to Gas from Coal. Achieved Clean Air

In 1992 IDGAS began expanding natural gas access to replaced lignite, and saw concurrent reduction in pollution

SOx dropped to healthy level in 2010



SOURCE: OECD Environmental Performance Reviews, Turkey 1999



Source: IGDAS

Santiago de Chile Introduced Pollution Controls. Gas Helped Meet them to Bring Blue Sky to City.

Santiago
Chile

1989

$PM_{2.5}$ concentration registered at 68.9 µg/m³, 7x recommended level

1992-98

Initial steps toward air quality regulation

Argentinian gas link built to enable supply

First gas-fired power plant began generating in 1998

2004-2011

2004: Gas supplied 70% of industrial and 24% residential energy

Supply interruption during 2004-2008

2009: new LNG terminal in operation restored supply & emissions dropped by by 1.76 µg/m³ vs. 2004-2008 period

2011: first air quality norm for $PM_{2.5}$ set

2016

Reduction of 39% of PM_{10} and 58% of $PM_{2.5}$ since 1990

Reduction 2.63 µg/m³ of PM from industrial sources

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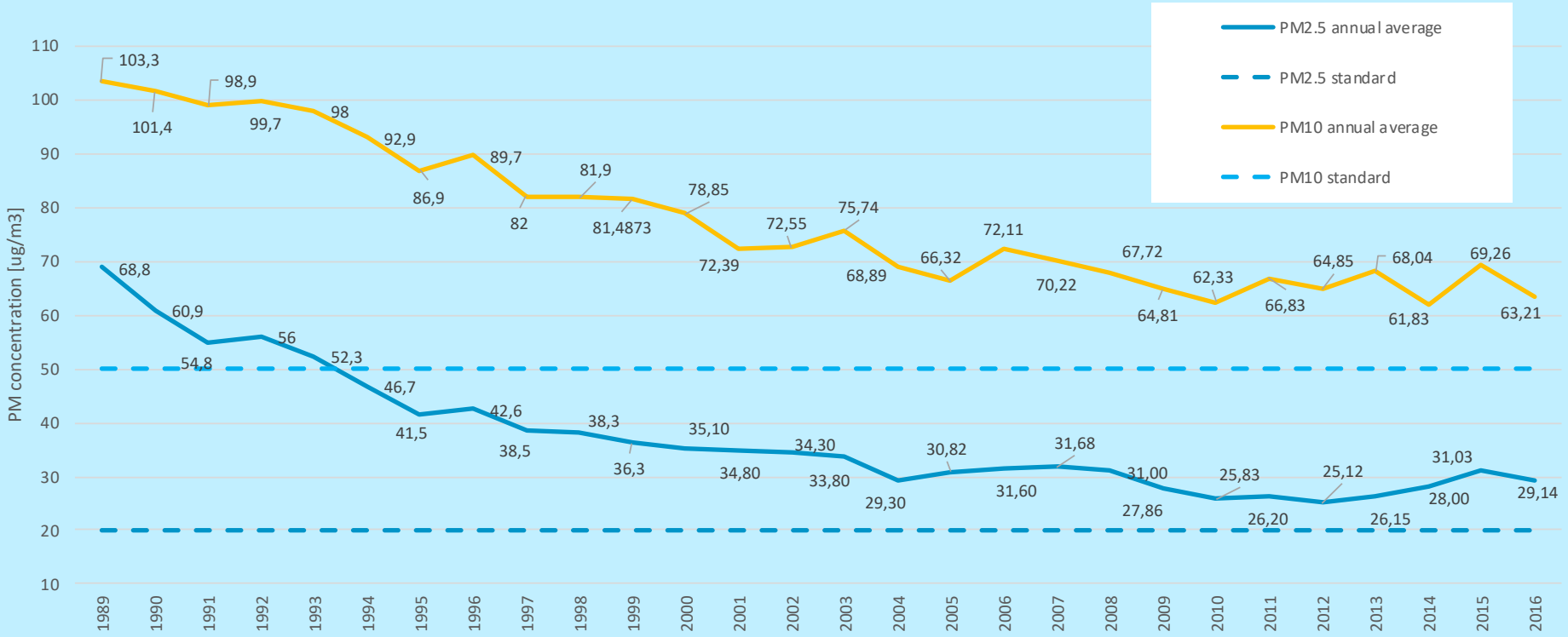
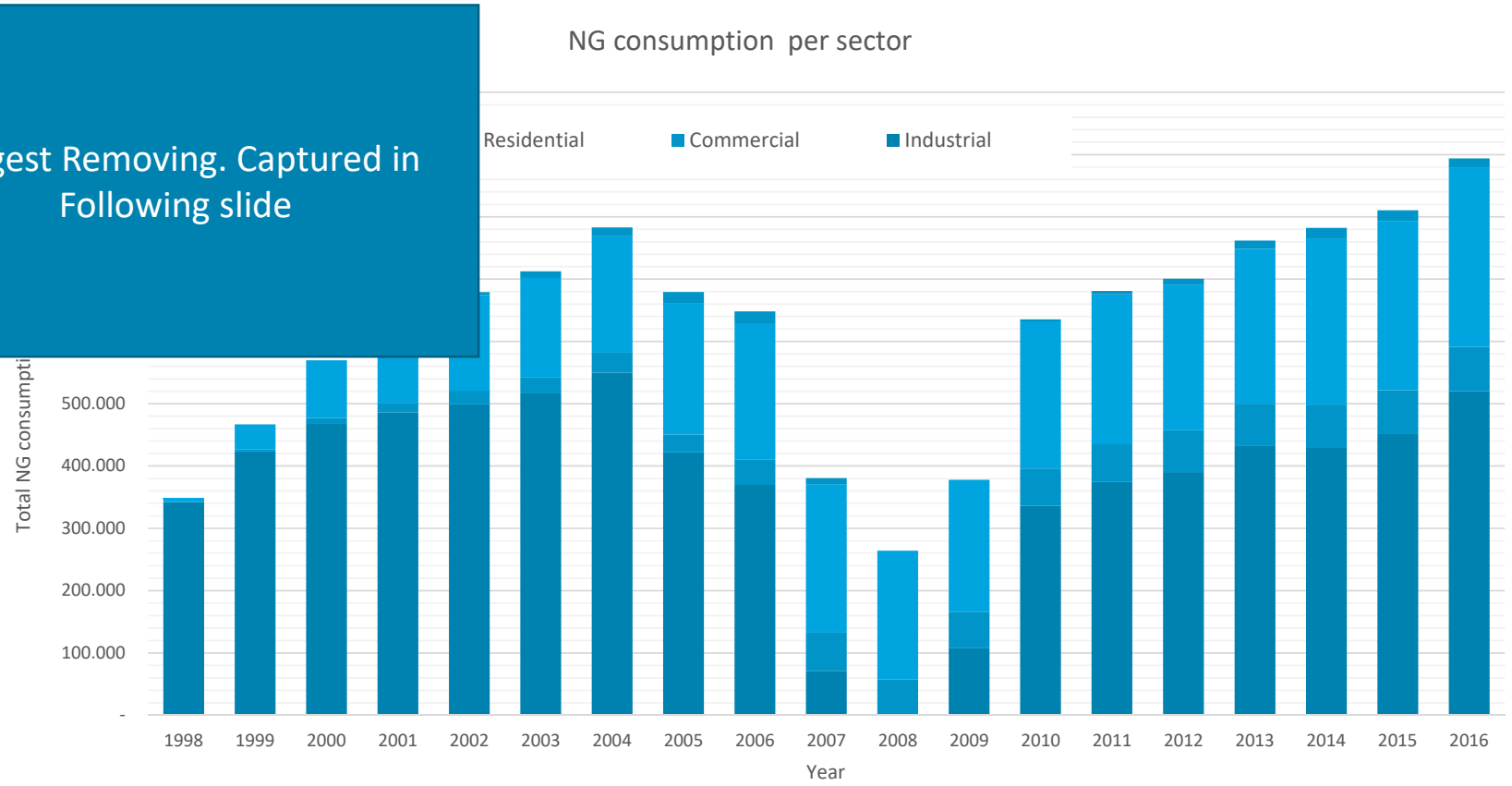
Santiago's Positive Air Quality Trend



The case Santiago de Chile

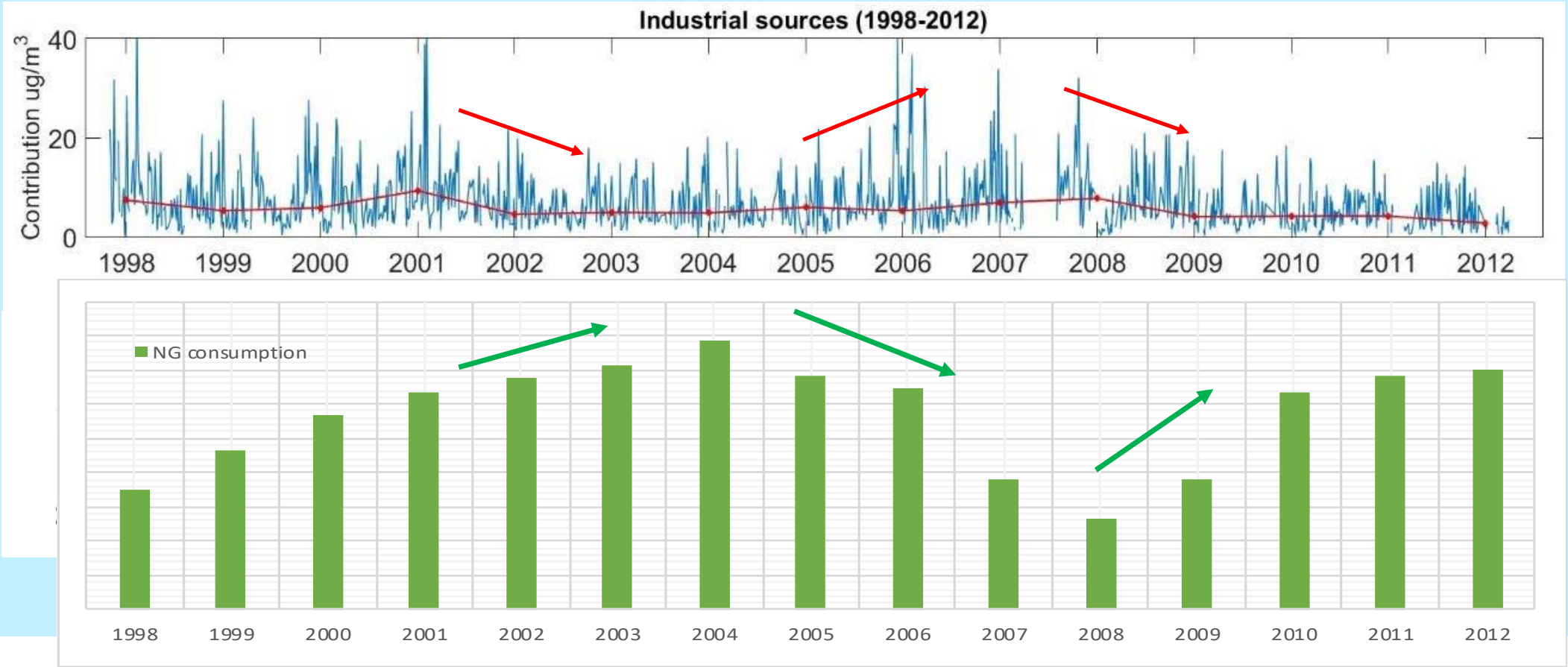
Natural gas consumption in Santiago, Chile

Suggest Removing. Captured in Following slide



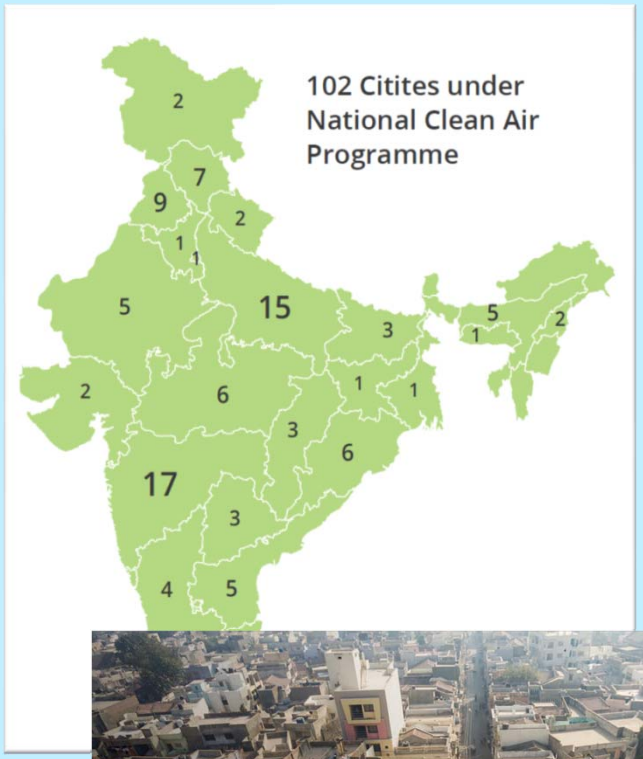
2007-8 Interruption of the Argentina gas supply

Santiago's Gas Consumption Was Directly Tied to Concentration of PM2.5



A Gas-Based Economy and Clean Air for India

India's War on Pollution



1.24 million people died from air pollution in India in 2017

= 12.5% of all deaths that year

War Against Pollution: declared by the government in January, 2019

National Clean Air Program: plans to reduce PM10 and PM2.5 by 20-30 % from 2017 levels in 102 cities, by 2024

A Gas-Based Economy: commitment to more than double the share of natural gas in energy mix - from 6% to 15% by 2022

City Gas Distribution (CGD) network extension planned to connect 70% of India's population, from current ~ 20% (per 2014)

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Morbi, the Ceramics Capital of Gujarat Achieved Clean Air by Industrial Fuel Switch to Gas

Sources: Hon. NGT Committee, "*Report on technological & environmental issues related to coal gasifier in ceramic industries of Morbi-Wankaner area, Gujarat*"; GPCB Monitoring Data

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Beyond Air Pollution, Morbi Saw Other Dramatic Environmental Benefits from the Switch to Gas

Parameter	Total Consumption in area	Positive impacts due to use of NG as a fuel
Reduction in coal consumption	900 MT/Day	Reduced truck movement- less vehicular emission, prevention of fugitive emission due to storage and handling of the coal
Tarry waste	900 MT/Day	No generation of Tarry waste now so no transportation and disposal
Wastewater management	3150 KL/Day	No wastewater generation now due to use of NG as a fuel so no energy utilization for disposal of wastewater
Water Consumption	2250 KL/Day	Reduced Consumption of fresh water which can cater to the town of @16,000 Population
Improved public perception	Low smog conditions, improved water sources, etc	Image of the industry in the public has improved due to improved ambient air quality and cleanliness in the area.

Source: GPCB, Case Summary, 2019

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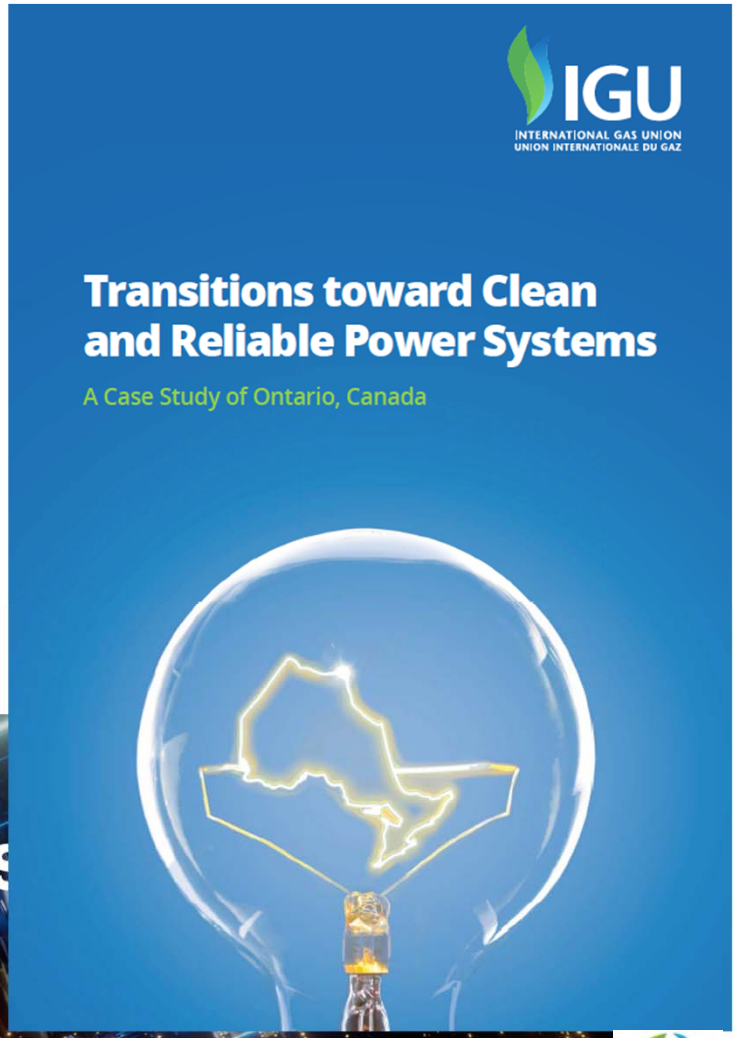
Ontario. Canada's Largest Province. Home to the Coldest Capital of the World.



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Ontario Eliminated All Coal-Fired Power. Replaced Quarter of Electricity Capacity with Gas, Renewables, Nuclear

Fig 3. Ontario Phaseout of Coal Power (MW)

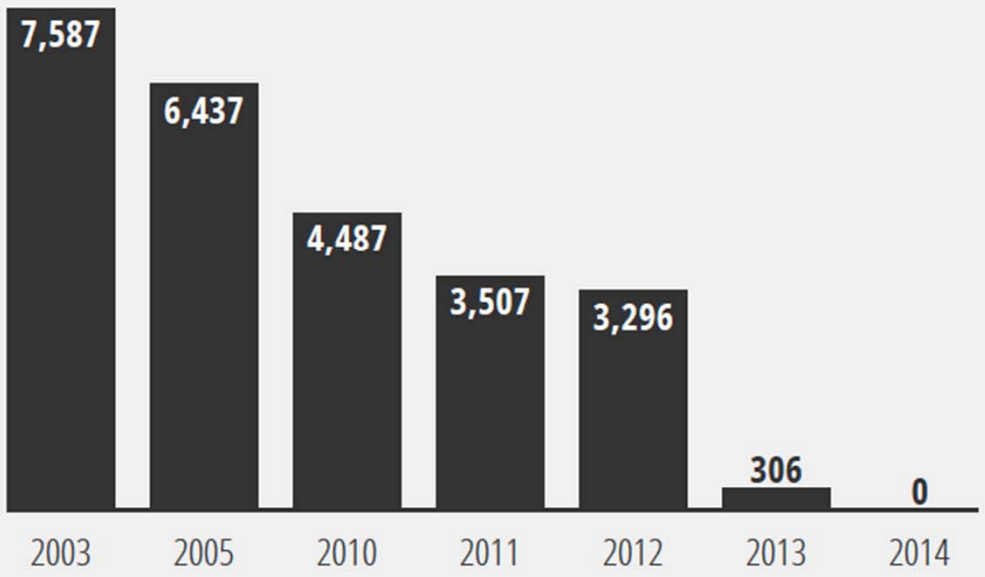
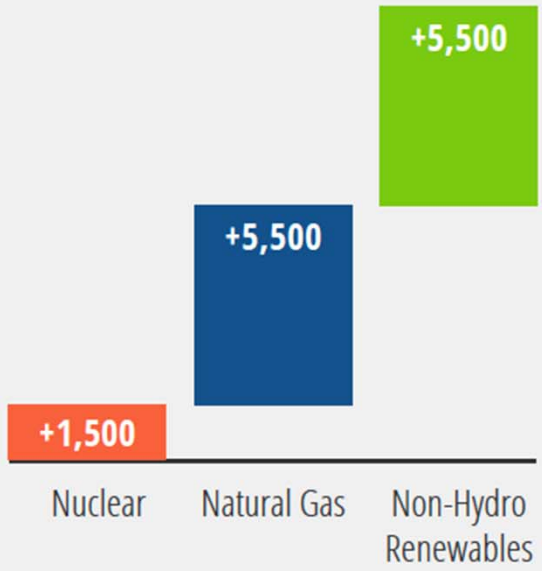
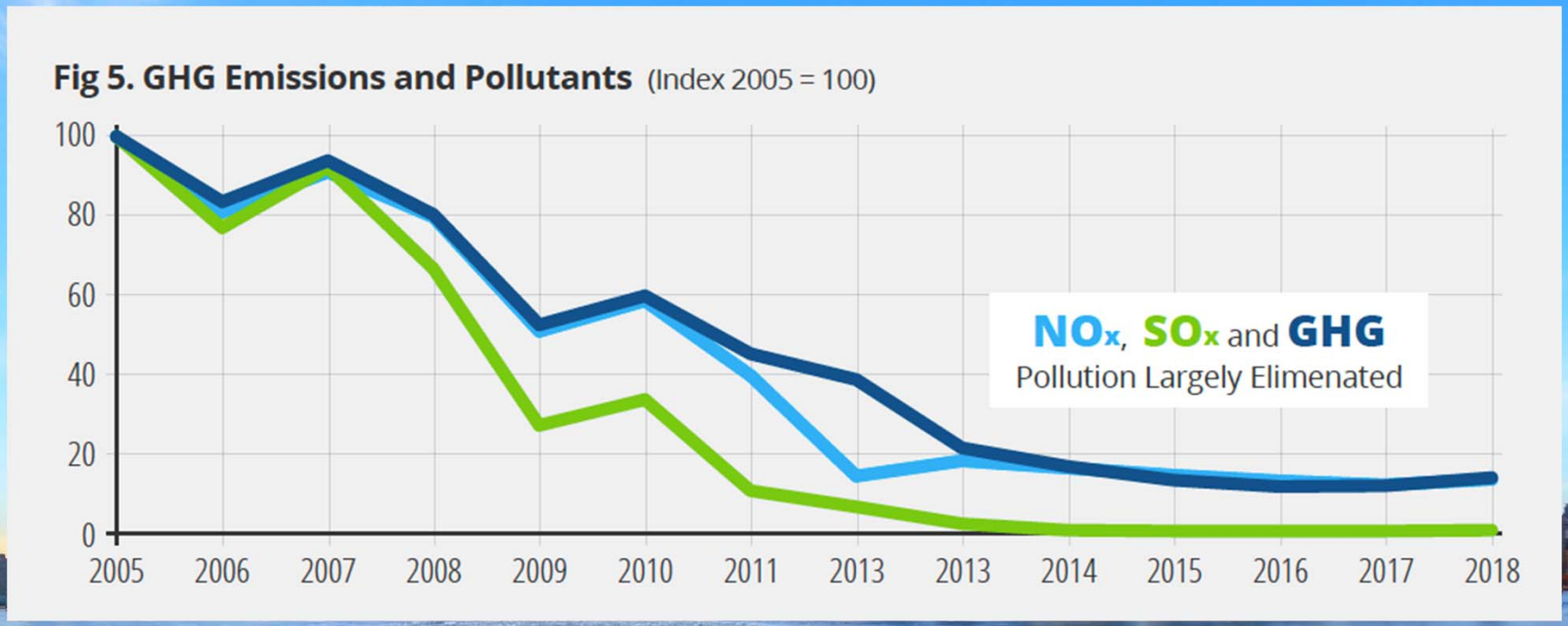


Fig 4. Replacement Generation Resources (MW)



Coal Phaseout Driven by Air Quality and Environment Goals. Policy Successfully Brought Blue Sky and Removed over 80% of CO2, SOx, NOx.

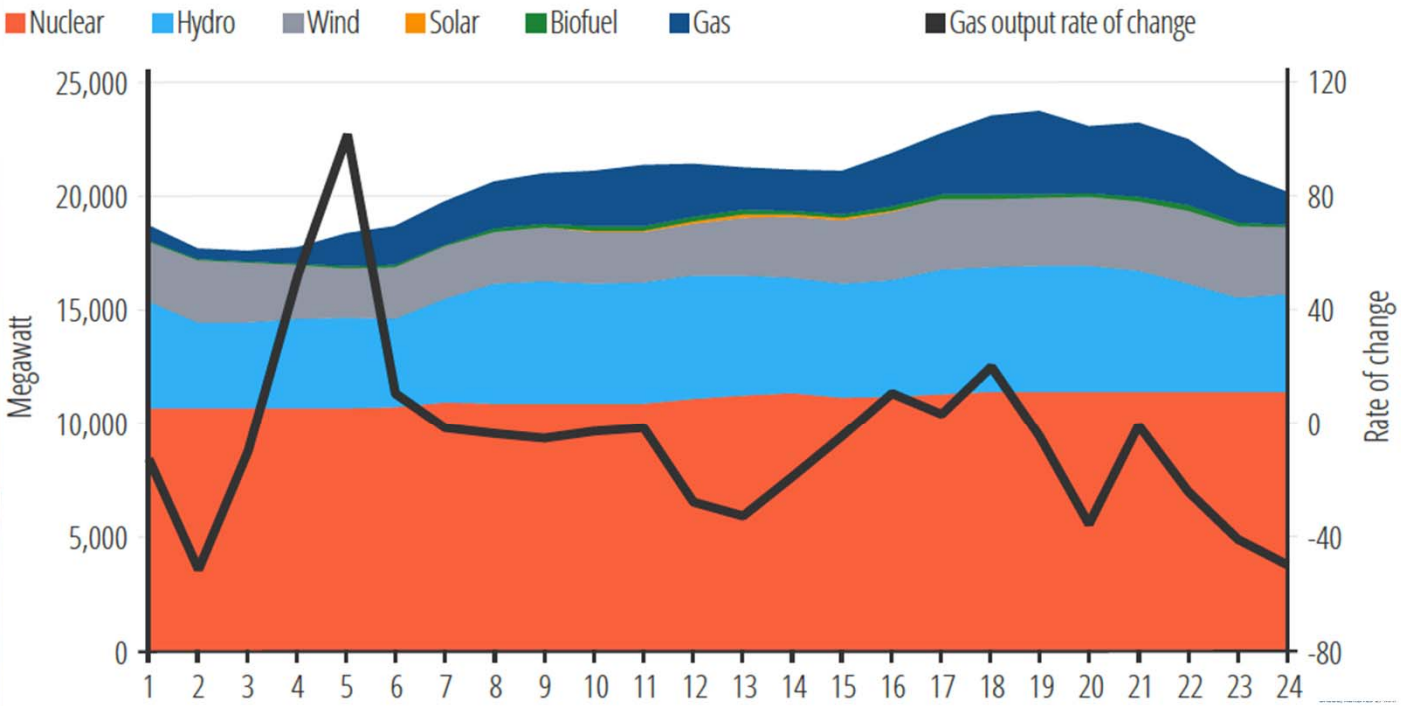


The case of Ontario , Canada

Reliability:

Gas Ramping in an Extreme Winter Weather Event

January 5, 2018. Ontario Generator Output (left) + Natural Gas Ramp Rate (right)



Thank you for your attention