Air Quality Management

Mitigation Strategy by a Citizen Environmentalist

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The 4 Decades

- Air Act was enacted in **1981** to ensure abatement of **air pollution.**
- High powered "Commission for Air Quality Management **(CAQM)**", conceived in **Oct' 2020**, likely to be a law by Parliament **(Jul' 2021).**
- In between, there have been many high level committees and "**Technology Challenge**" was mooted by **CPCB** in **Dec' 2020,…..**
- ……Why do we seek suggestions, when 100s of Experts are there?
- They generate Reports, Research Papers, Recommendations.

R – 1 (Report of June 2021)

- Particulate Matter ($PM_{2.5}$) is at the root of problem.
- **Stubble burning** could contribute **1 - 50%** of total particulate matter in Delhi. **Page-12, Section-4.3**
- Coal based power plants **(13.2 GW)** operating within **300 km** of NCT have significant contribution to Delhi air. **Page-16, Section-4.4.1**
- Is there a way to get rid of these TWO factors**?**

R – 2

- $PM_{2.5}$ – is the primary air pollutant in Delhi, according to **R-2**.
- Elaborate scientific study was conducted to identify various sources and their share/ contribution.
- The findings of "Real-time quantification and source apportionment of fine particulate matter including organics and Elements in Delhi", are summarised in **next slide**.

The Study….

- Identified more sources, like **cooking** that were ignored in earlier.
- Secondary oxidized pollution particles formed due to pollutants reacting with molecules in the atmosphere, had following share -
  - **64% organic aerosols** (vehicular fumes, cooking etc.)
  - **27% elements** (metal particles from power plant emissions, industrial waste burning, etc.)
  - These are further divided as in the **next SLIDE** ……

The Study (continued…)

- 3 major factors contribute to organic aerosols during summers—

  (1) Vehicular emissions **(12.3%)**, **(2)** solid fuel **(16.2%)** **(3)** cooking **(7.3%).**

- Elements mostly from dust **(52.5%),** power plants emissions **(16.2%),**
  - garbage burning and steel industries **(10.7%),** solid fuel combustion **(10.5%),**
  - non-exhaust pollution from reasons such as **road dust**, and **industrial waste** burning **(1.5%)** and …. **metal processing industries (1.4%).**
- **Could we generalize this data irrespective of LOCATION/ TIME?**

The Study (continued…)

- Secondary organic aerosols are **28.4%** in **summers**, but **4%** in **winters**,
- In 2016, a round the year study in Summer had following data –
  - Coal and fly ash **(26-37%),**
  - Secondary particles (10-15%),
  - Vehicular emissions **(6-9%) (?)**
  - Soil and road dust **(26-27%) ?**
  - Biomass burning (7-12%),
  - Municipal solid waste (7-8%).
- SME metal processing units of Punjab, Haryana, **Pakistan** were contributing to **CHLORINE** in Delhi's $PM_{2.5}$ levels. **(?)**

Management - 1

- Since all data is collected and analysed very scientifically, we can't question – **But how are we going to CONTROL?**
- Dozens of mitigation measures were employed in NCT of Delhi and NCR in 2019, 2020. These were applied without **specific target for** –
  - A particular FACTOR and its MAGNITUDE.
- **Management** approach for mitigation needs **Verifiable Target**.

Mgt. in Ghaziabad

- Industry closed for 2-weeks, all Construction SHUT down;
- Brick Kilns closed, Strict vigil on garbage burning.
- Water sprinkling on ROADS (purchased 10 tankers)
- Road SWEEPING machines procured / used, replacing manual work
- Heavy penalty for selling construction material in the OPEN.
- STILL……my city topped the list of **Most Polluted Cities**.

Mgt. in Delhi

- Engine OFF on Traffic Signals. Odd-Even scheme operated;
- Many Apps Introduced. Electrical Vehicle policy announced.
- Massive tree plantation program.
- Penalty to North Delhi Municipal Corporation and other Govt bodies.
- Chemical spraying in fields to avoid Stubble Burning.
- Smog towers under installation in Rajiv Chowk, Lakshmi Nagar.

But…..No Control

- All top agencies, like - CPCB, NGT, 3-Member Monitoring Committee (Bhure Lal), and the Supreme Court, issue directives.
- They have **No Control** over multiple operating agencies on ground; none is **Accountable** for non-fulfilment of **Targets** (?)
  - Many actions are random, without **TANGIBLE** achievement.
- It needs an area specific **Enterprise (Startup)** to coordinate with all operating agencies/ stakeholders and function in **PPP mode**.

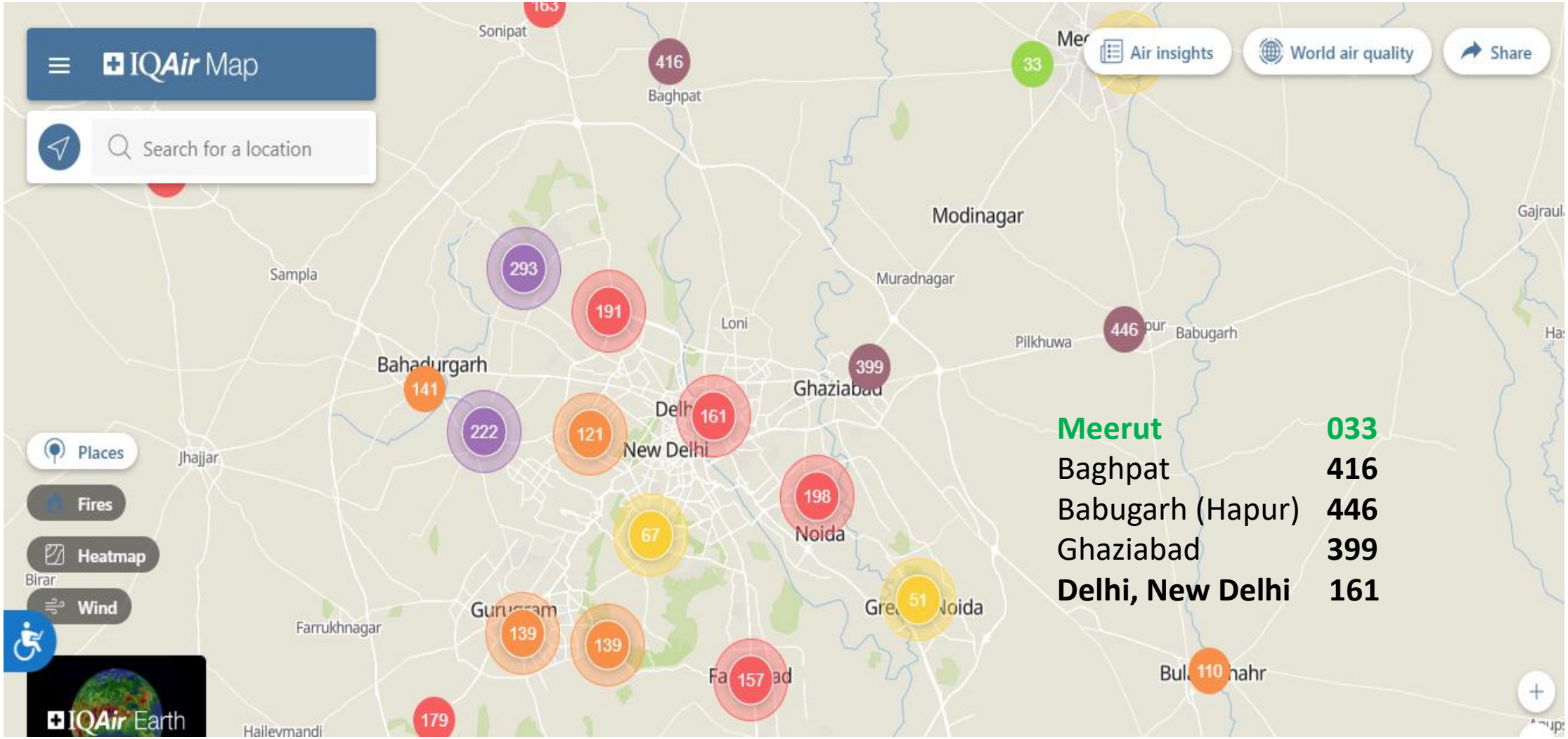
Why L M E ?

- Effective CONTROL requires a **Local Management Enterprise** (LME) to collect local AQI data, identify local FACTORS, plan remedial actions after fixing priority; coordinate with all stakeholders.
- To add **AUTHORITY,** LME should have representation of **CPCB** or other concerned **Ministry/ Department of Govt**….
- ……That provides communication channel to the authority for **non-compliance**, or non-fulfilment of GOAL, suggests alternate strategy.

Functions of LME – (1)

- Air Quality varies widely from place to place, even within Delhi, the 30+ monitoring stations have different AQI.
- Each location needs different treatment (mitigation strategy), to be planned after detailed analysis.
- LMEs will lay more stress on **LOCAL** factors, rather than **Cross Border** issues, which need to be dealt separately.

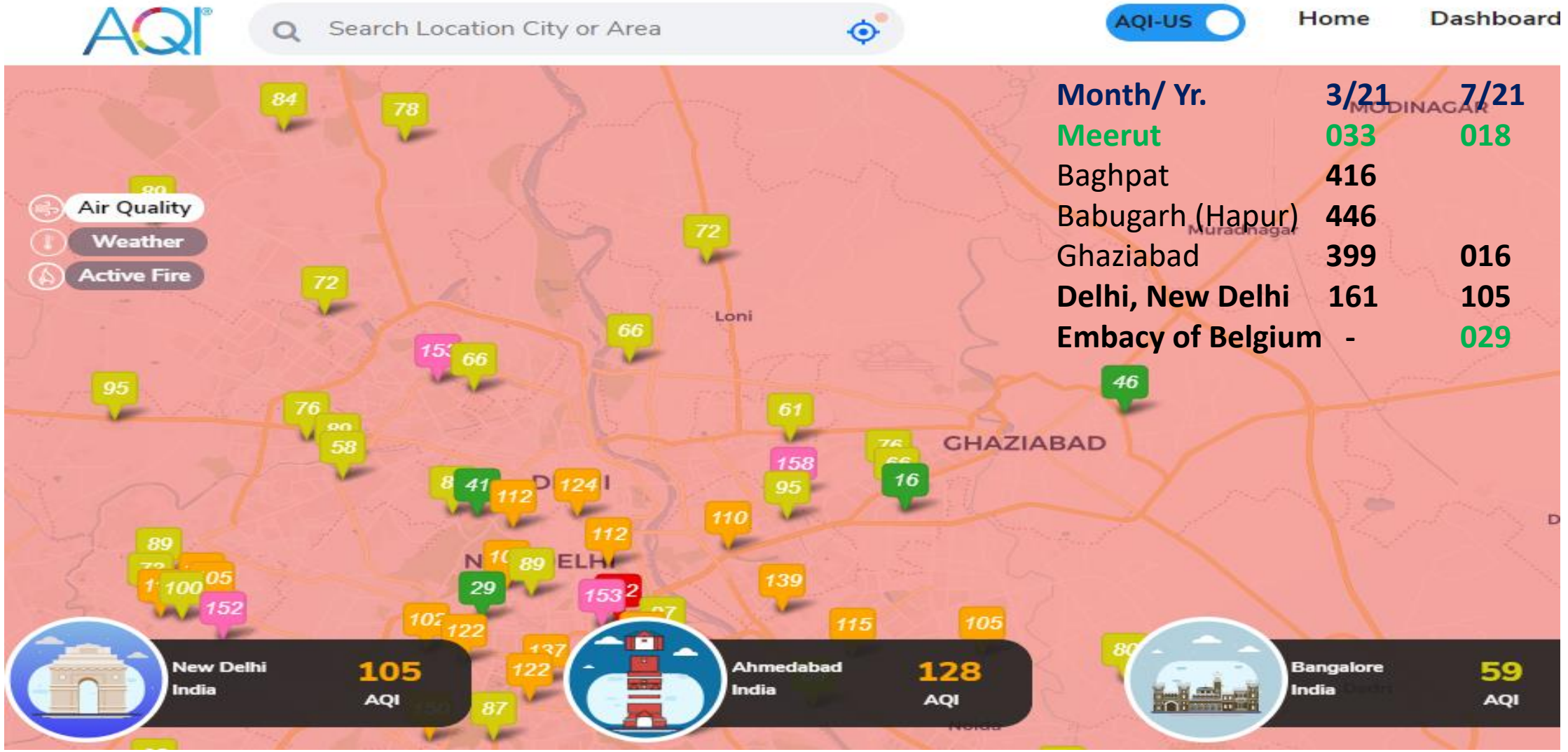
AQI – Delhi March 31, 2021



AQI – April 25, 2021

- City averages of AQI in place like Delhi don't carry meaning.
- **April 25th 2021** (6:00 AM), when New Delhi AQI on my iPhone was **142**, the website showed consolidated figure as **298.**
- AQI varied widely for different stations, like – **US Embassy** (**420**), **Belgium Embassy** (**71**), **Okhla-2** (**173**),
- Similar variations are visible in the next slide …….

AQI – Delhi July 22, 2021

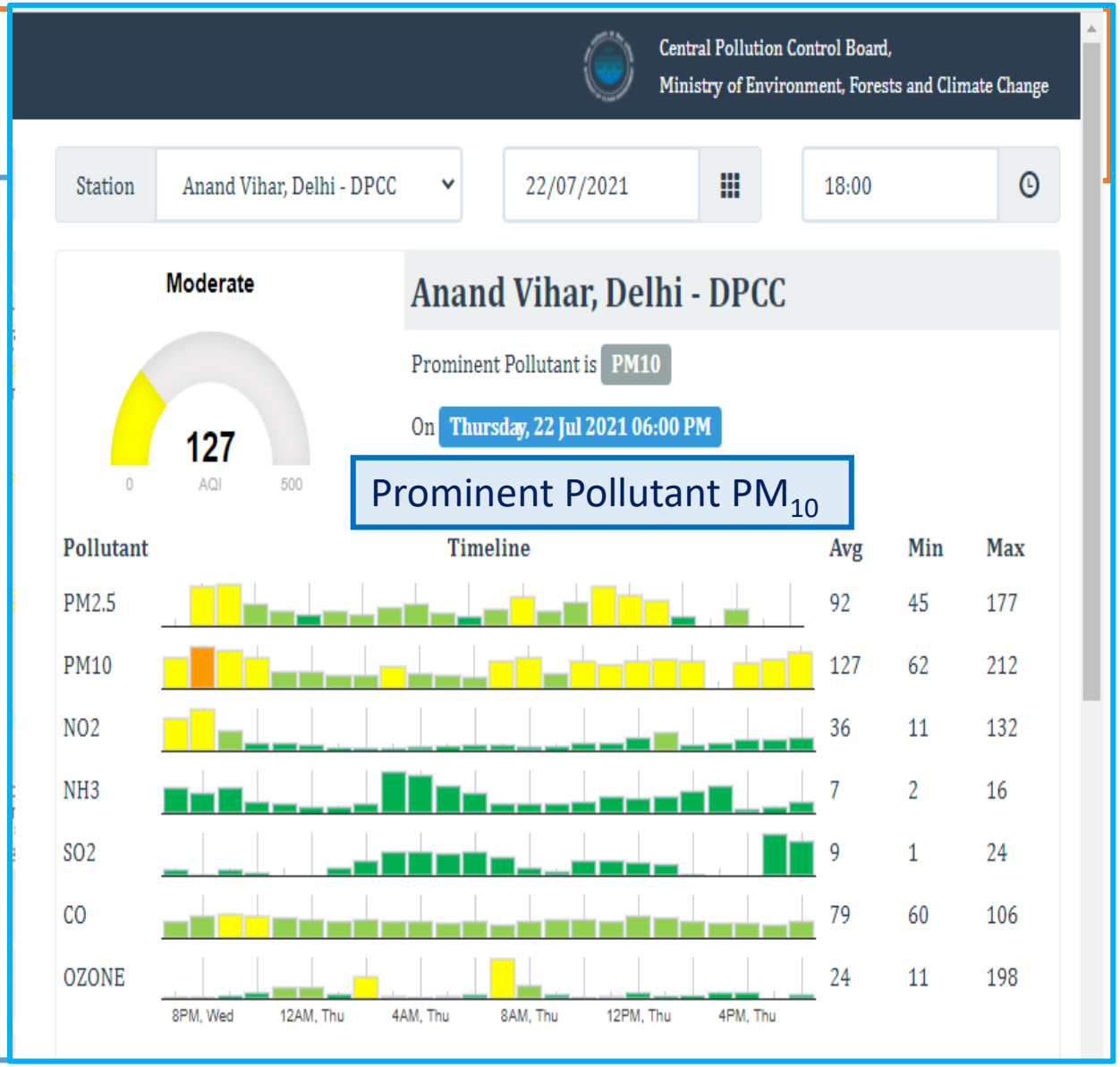


AQI – Delhi July 22, 2021

	April'21	July'21
• Meerut	033	018
• Baghpat	416	-
• Babugarh (Hapur)	446	-
• Ghaziabad	399	16/ 46
• Delhi/New Delhi	161	105
• Belgium Embassy**	-	029

- **Figure Anand Vihar Delhi 6 PM, 22 Jul'21**
- **Delhi AQI 127 (PM2.5 : 45-177), Avg. 92**
- **PM10 range 62-212, Avg. 127**
- **What are we going to control and how?**

** This was **71** when **US-Embassy** was **420**



Functions of LME – (2)

- Having identified factors, RANK according to importance / criticality, following **A B C analysis** method of Management.
- Give importance to A, followed by B and C. Spending energy on C is never advised in management parlance.
- Could **MoEF&CC** manage all segments of Economy / areas that are under control of different Central Ministries/ State Govts ?
- We need to **Delegate/ Share**, to let everyone feel responsible.

Sharing Responsibility

MoRTH, Auto Ind., SIAM	Vehicular Pollution (VP)
MoPNG, PCRA, STAs	VP, Industry, Domestic Cooking etc.
Min. of Agriculture	Stubble Burning etc.
MoUD, MoRTH,	Civic Bodies, Construction Ind.
MoMSME, Ind. Associations	MSME
Min. of Heavy Industry, NPC	All Coal Users, Steel Plants
MoEF&CC – Overall coordination and Afforestation……	

Vehicular Pollution

- Petrol, Diesel, CNG are going to stay for decades. BS – 6 norms apply to only new sales; others need to maintain FITNESS.
- **PUC** certification needs better management; **Annual Service Record**, should be mandatory for all Commercial/ Personal vehicles.
- Speed control is needed for both EMISSIONS and Road Safety; besides lane control (discipline), observance of traffic rules.

Pollution + Road Safety

- Could be clubbed for Automobile sector that should set its sectoral targets, and support through active participation in –
  - **Engineering** **Education** **Enforcement**
  - **Traffic Jams** and road related issues need involvement of Civic Bodies, State Transport Authorities, PWD, Development Authorities (DDA, GDA etc.)
- Parking, Encroachments, deaths by Accidents, Pollution (Air Quality), others factors needs better data management.

LME needs Handholding

- Startups supported by Govt/ Semi Govt/ Industry bodies will facilitate business opportunities that are badly needed to revamp government schemes/ programs.
- The starting points are Academic Institutions that could as well participate in management of many civic amenities: **Public Transport**, 24-Hour piped **Water** supply, solid **Waste** management, design and maintenance of **Drains**, Parks and Green Belts etc.

LME for Business

- Scope is endless; need is to create awareness and make a beginning.
- During implementation of graded response to Air Quality control GRAP, the CPCB deployed 50 teams during Nov’ 2020 – March’ 2021,
- Let these people be associated with couple of STARTUPS to work on Out-of-Box ideas, making use of best of the Technologies and innovative Management Practices.
- **CONTROL needs corporate culture + concern for cost and tangible outcome.**

Research

- R-1 is a latest report of CERCA project report of June 2021
- R-2 is a study by one of the institutions of national importance (2019)
- Centre for Science and Environment (CSE) reported use of 1400 Ton per annum coal in NCR that affects air quality in Delhi.
- An IIT Delhi research reports refers to harmful particles generated during frequent braking of vehicles that affects health of citizens.
- Research has to specific with ……..FOLLOW UP for Results.

Impact Assessment

- The Hindu, Bengaluru: Feb' 18, 2021

- Air pollution claimed approx. 54,000 lives in Delhi in 2020; Delhi, MB, Bengaluru, Chennai, HBD and LKO — feature in the global analysis.
- Globally, approx. 1,60,000 deaths due to PM 2.5 in the five most populous cities — Delhi, Mexico City, Sao Paulo, Shanghai and Tokyo.
- Estimated 25,000 avoidable deaths in Mumbai. Bengaluru, Chennai and HBD approx. 12,000, 11,000, and 11,000 respectively."
- 'Cost Estimator', online tool estimates real-time health impact, economic cost from PM 2.5, in a collaboration between Greenpeace S E Asia, IQAir and the Centre for Research on Energy and Clean Air (CREA).
- Algorithm applies scientific risk models in combination with population and public health data to economic costs of air pollution exposure.