# Concept of Self Regulation

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# Can state pollution control board inspect all Industries at regular interval?

# Report Card – Manpower crunch

While…

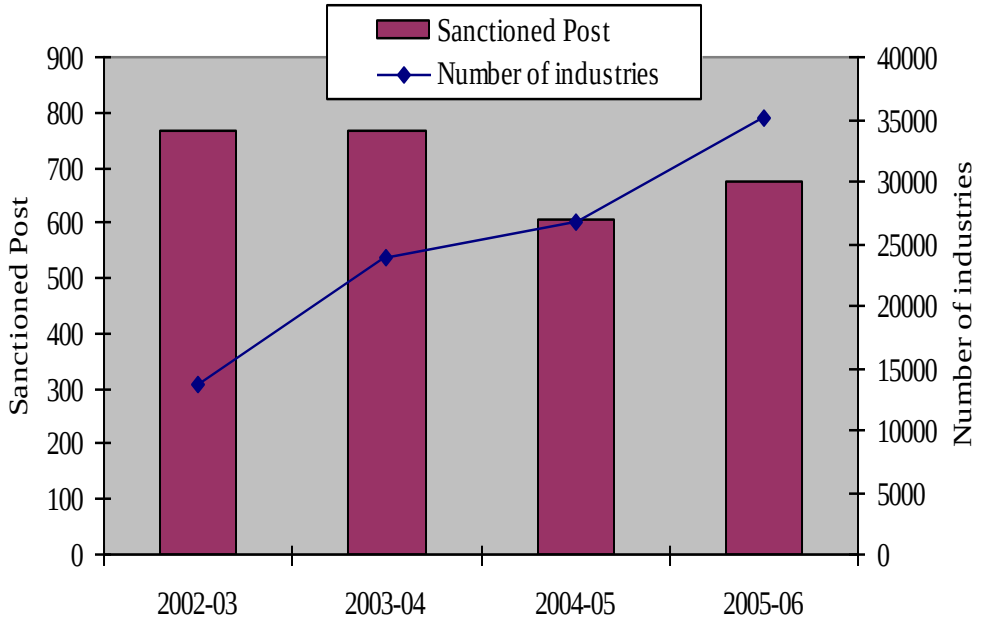
- Number of industries have gone up significantly
- Board's scope of responsibilities has gone up manifold – more legislations

BUT…

- The number of employees remain unchanged
- Difficulties in attracting right kind of manpower
- Existing technically qualified staff leaving for better opportunities

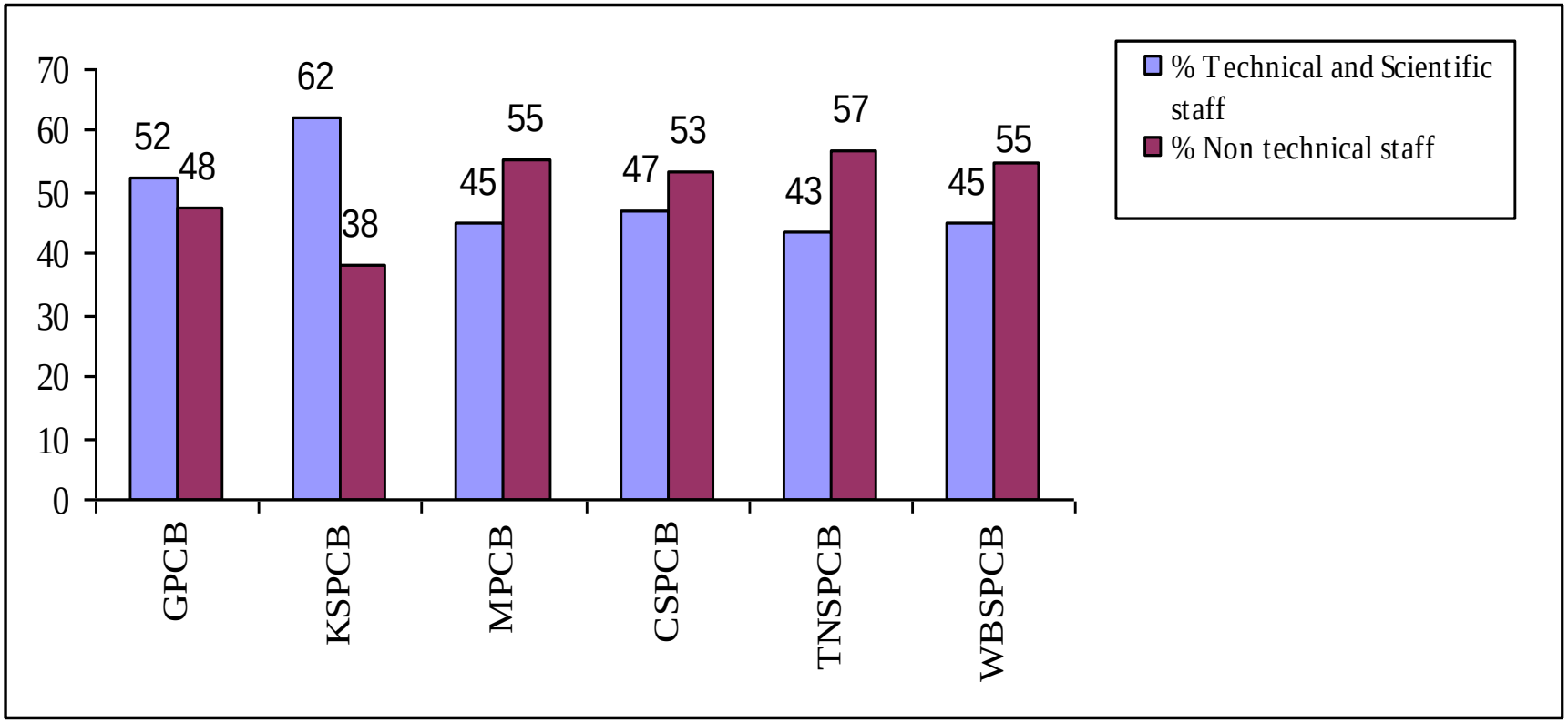
# Report Card – Manpower crunch

- **No or minimal increase in sanctioned positions even though number of industries going up**
- **In Karnataka PCB, number of sanctioned posts dropped by 6.5 per cent while the number of industries went up by 156 per cent**

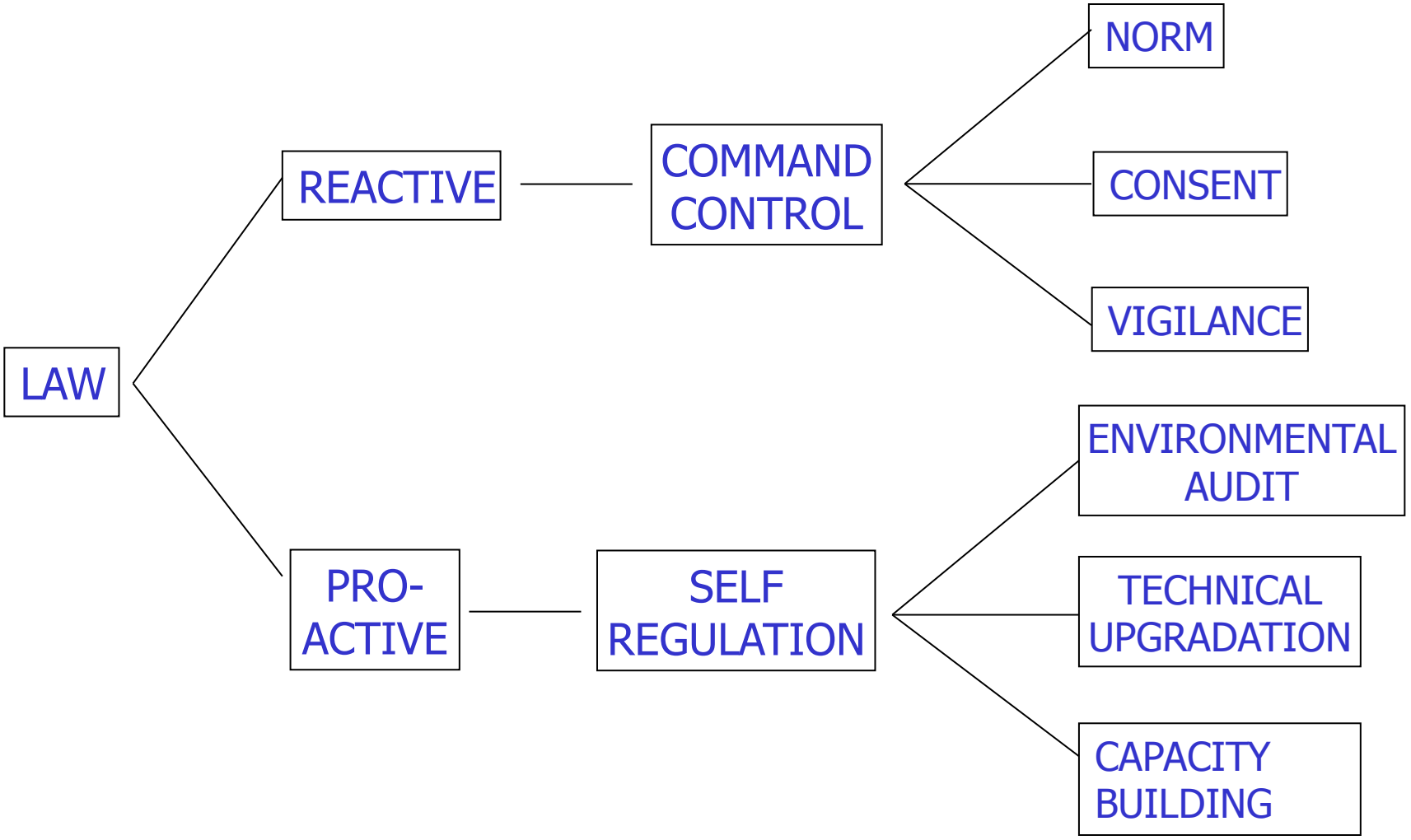


# Report Card – Manpower crunch

- **Not only less manpower, the state boards also do NOT have right kind of manpower**
- **Most boards dominated by administrative staff**



# Dimension of Law



# Proactive measures

- Industry shall be an effective partner on pollution control
- Introduction of self monitoring and assessment and appraise to SPCB periodically
- Conduct environmental audit by accredited auditor, self rectification and appraise
- Encourage to adopt ISO 9000 and ISO 14000 for integrated environmental management system

# **Right to have information:** *Develop monitoring network*

- **Power to have information for PCB**
  - Under 20 (2) (3) under Water Act
  - Under 31 (1) under Water Act

- **Power to obtain information under section 23, 25**

- **Specify self Monitoring protocol and reports to PCB under section 25 (3), of water act 21 (4) under Air Act as consent condition and under 6 of hazardous and other waste (management and trans-boundary Movement) Amendment Rules, 2016.**

# PARADIGM SHIFT ON POLLUTION CONTROL

Treatment of pollutant – At end on pipe – command and control

or

Prevention of pollutant generation – understanding process – self regulation

# Consent Condition under water Act and Scope of Self Regulation

| Sr. No. | Consent condition | Provision under water Act |
|---|---|---|
| 1. | Validity of consent | 25 (4) (iii) |
| 2. | Quantity of Water consumption and wastewater generation | 25 (4) (ii) |
| 3 | Quantity of wastewater | 25 (4) (ii) |
| 4 | Defined outlet | 25 (8) (a) (b) |
| 5 | Validity of effluent treatment scheme | 25 (4) (i) (ii) |
| 6 | Specify the production/quantity per day | 25 (4) (i) (ii) |
| 7 | Specify self monitoring protocol and reports to PCB | 20 (2) (3) 25 (3) |
| 8 | Laboratory Procedure | 20 (2) (3) 25 (3) 31 (1) (2) |
| 9 | Facilities for Inspection | 23 |
| 10 | Receiving water body | 25 |
| 11 | Housekeeping | |
| 12 | Ensuring separation of control equipments in good running condition | 25 (4) (iii) |

# Consent condition under Air Act and Scope of Self Regulation

| Sr. No | | Consent Condition | Provisions Under Air Act |
|---|---|---|---|
| 1 | | Site Selection | 17 (h), 21 (4) |
| 2 | | Validity period | 21 (4) |
| 3 | | Approved fuel | 19 (3) (4), 21 (4) |
| 4 | A | Adequacy and specification on control equipment | 21 (5) (1), 21 (4) |
| | B | Ensure control equipments running in good condition | 17 (9), 21 (4) |
| 5 | | Laying down standard | 21 (4) |
| 6 | | Product and product mix | 21 (4) |
| 7 | | Housekeeping (Loading and unloading or raw materials) | 21 (4) |
| 8 | | Reduce fugitive emission including storage of raw material referred to farm tank area | 21 (4) |
| 9 | | Self regulation, monitoring both ambient and stack and LDAR programme | 21 (4) |
| 10 | | Chimney height and specification | 21 (5) (iv) |

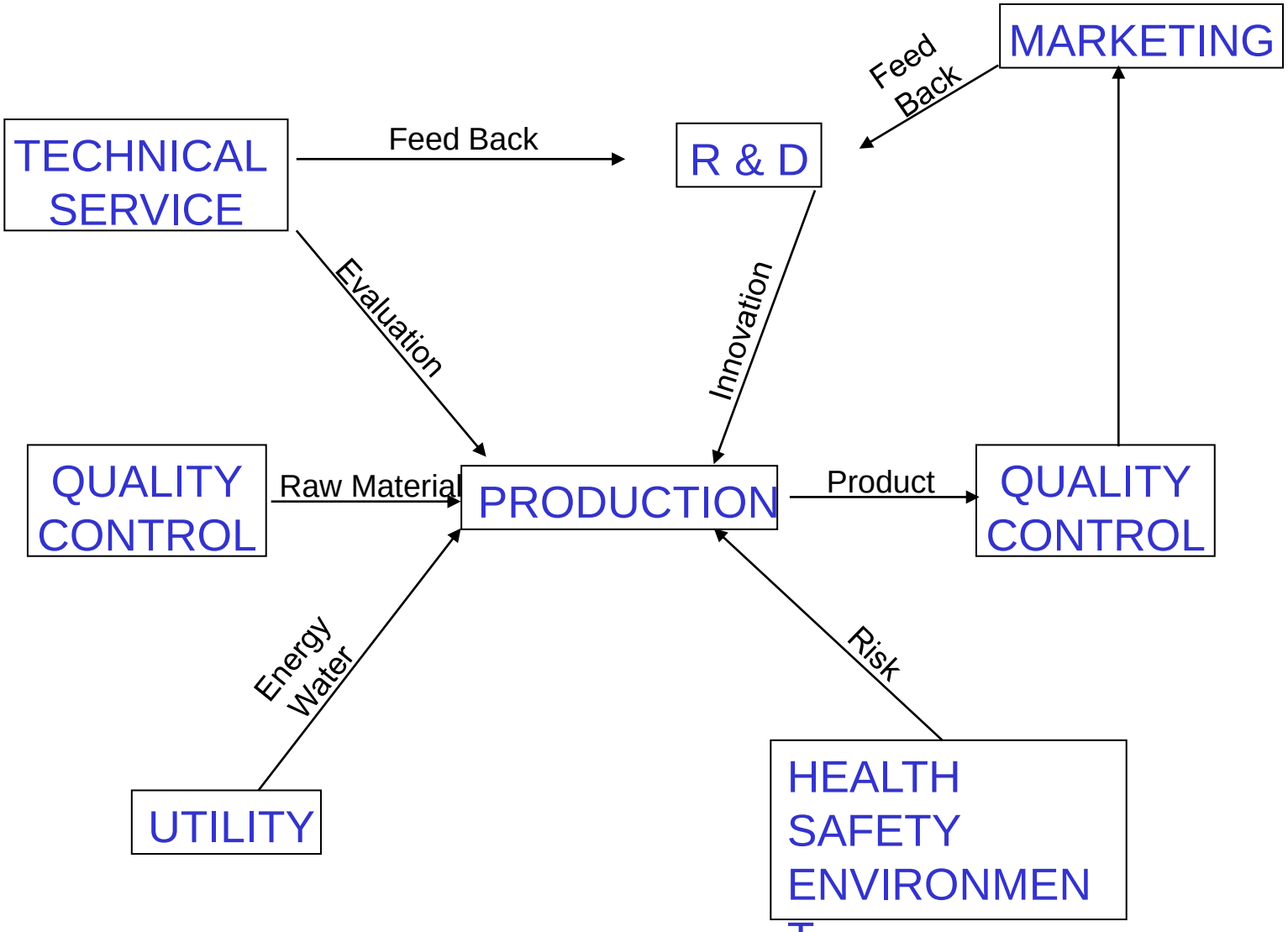
# COMPONENTS OF SELF REGULATION

- **Organizational and policy**
- **Pollution assessment – monitoring data and management**
- **Waste minimization**
- **Transparency and report writing**

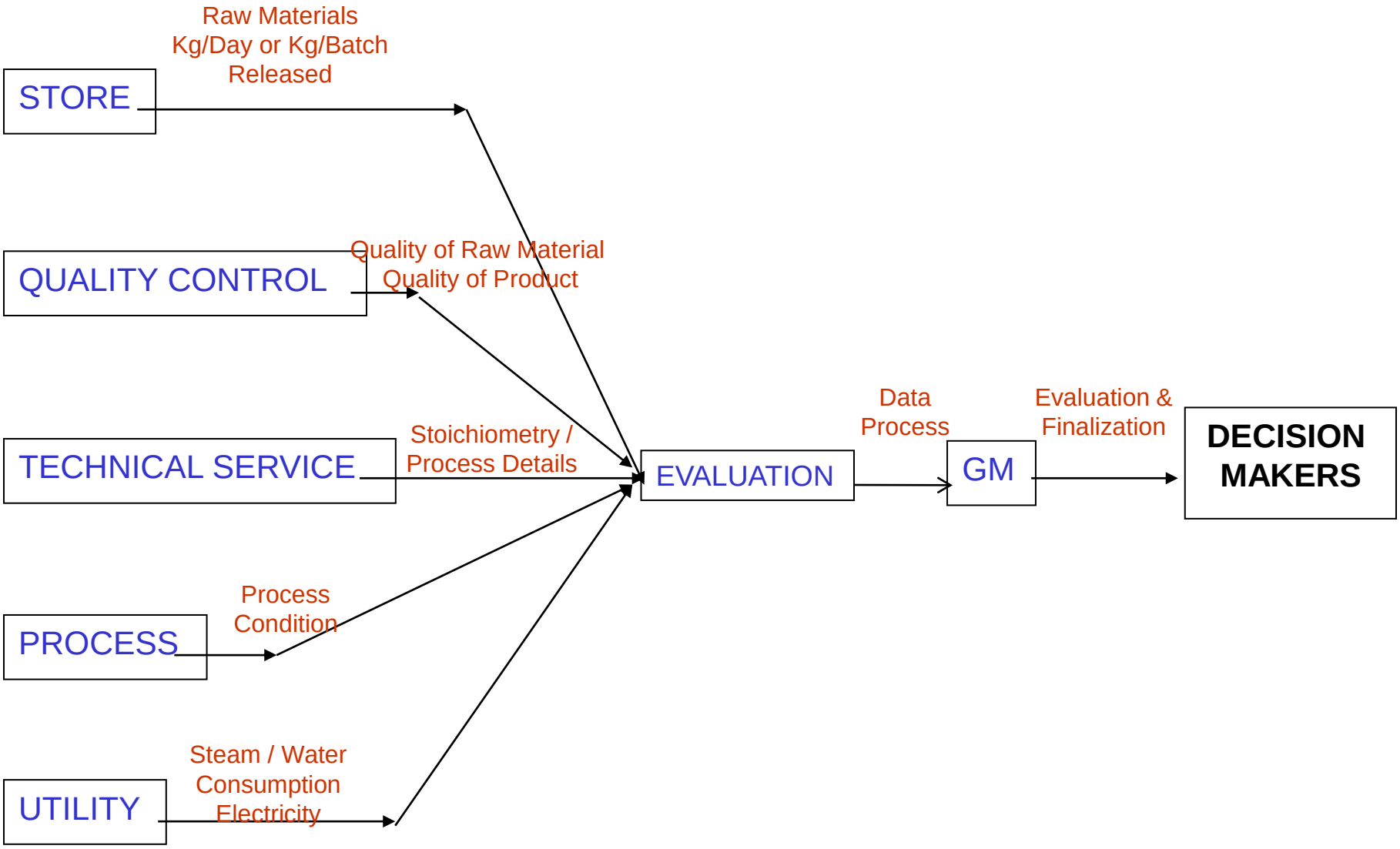
# COMPONENTS OF POLICY

- Ensure pollution control norms
- Conservation of resources
- Environmental impact assessment in operation phase
- Develop Environmental Management System
- Integration of all departments on Environmental Management
- Database creation and action plan
- Training and awareness

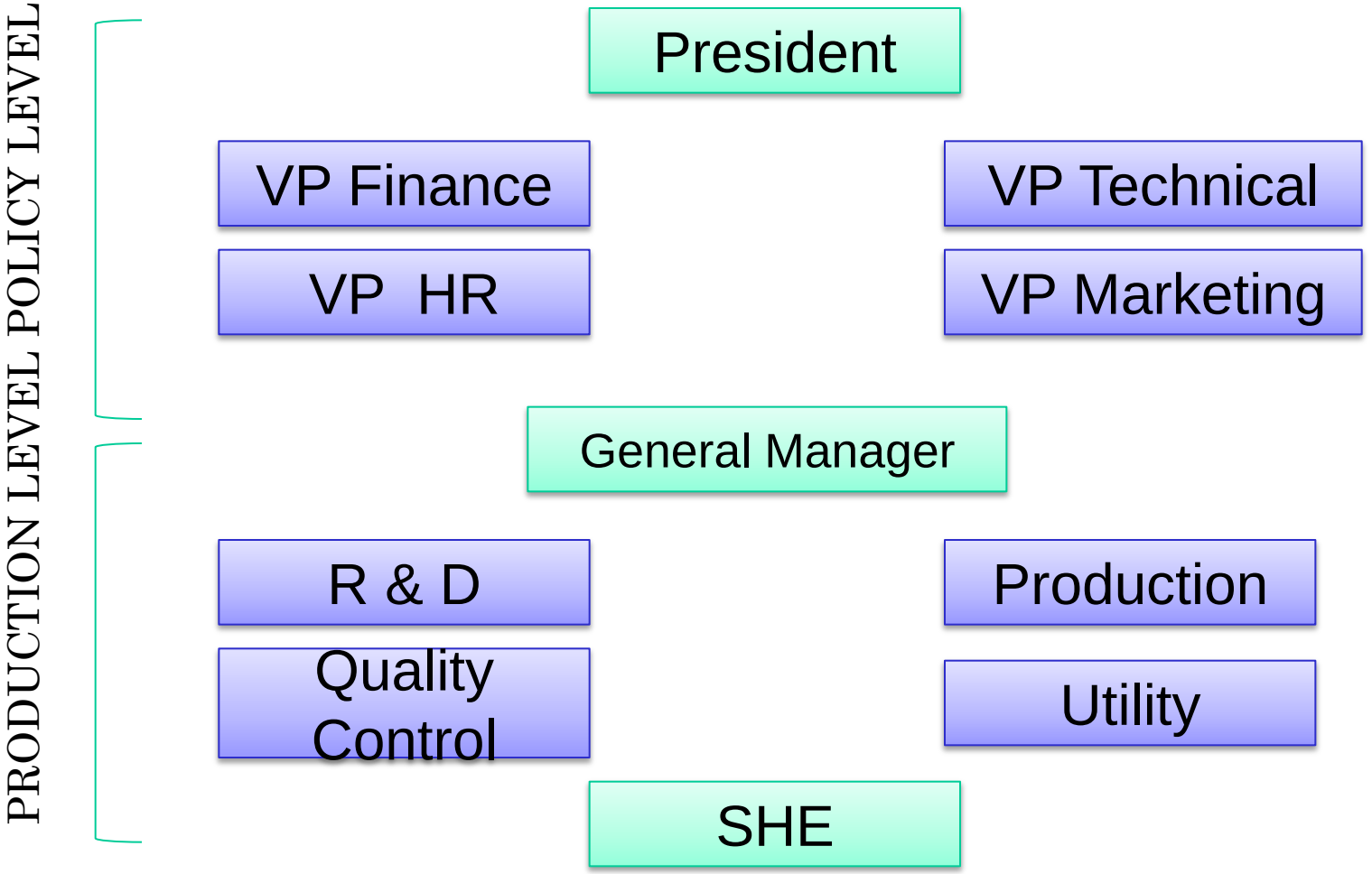
# INDUSTRIAL SYSTEM AND ORGANISATION



# INFORMATION NETWORK SELF REGULATION



# ORGANIZATION – AN EXAMPLE



# Task to be performed

- Assessment of pollution
- Performance of pollution control devices

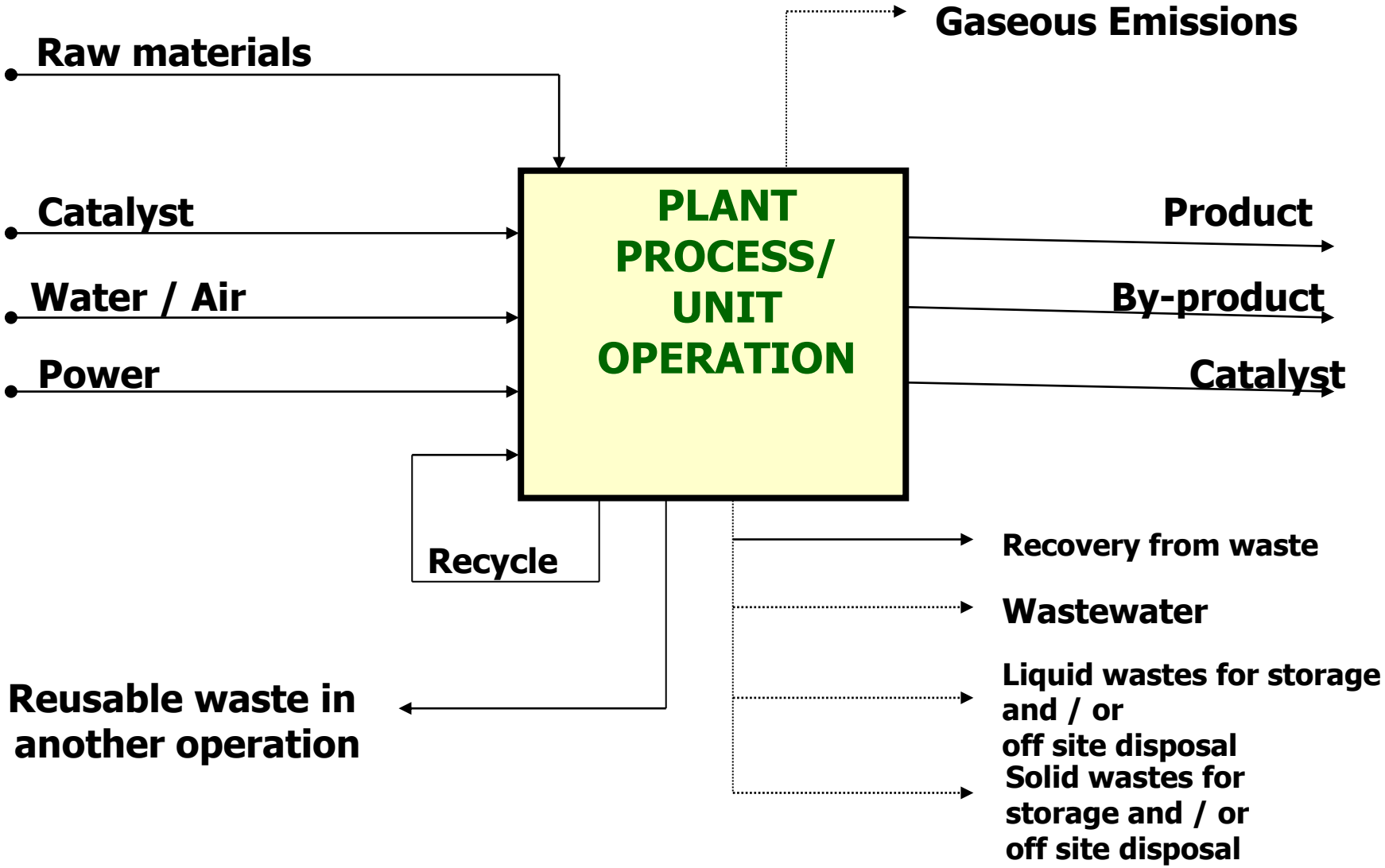
# Assessment of pollution

- **Monitoring** is a programme for a systematic observation in order to draw inference (prediction) about the experiment or the phenomena for which it is designed.
- By systematic observation means a periodic observation with regular intervals.
  - ➔ When (how often) to observe ?
    - → frequency of observation
- By observation in science means measurement
  - ➔ What to measure?
    - → parameters to be defined
- The third component of monitoring is the location
  - ➔ Where to sample?

# Pollution Assessment

- **Unit operation / process wise**
- **Plant wise**

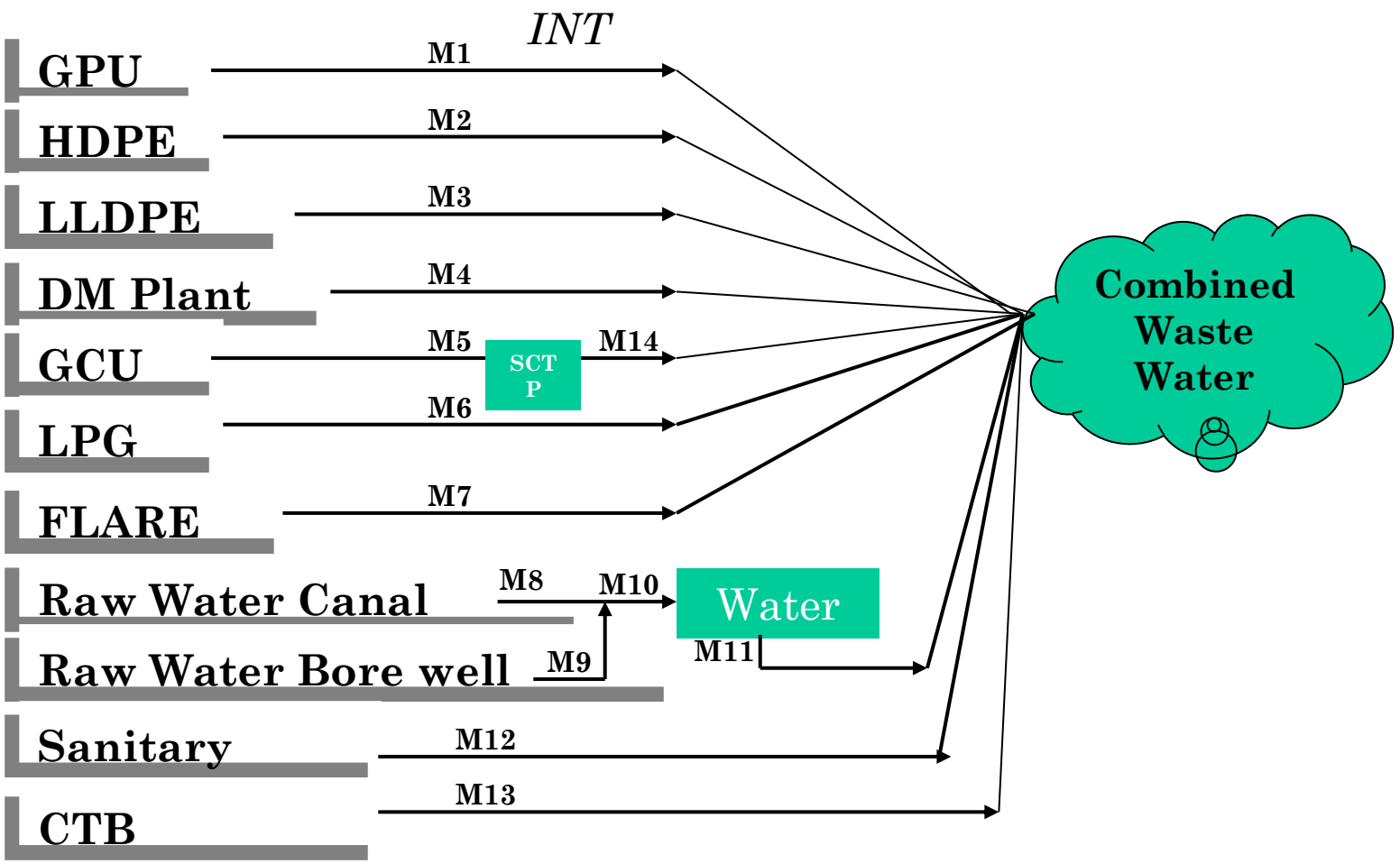
# PICTORIAL REPRESENTATION OF UNIT OPERATION/PROCESS



# ASSESSMENT OF POLLUTION LOAD IN WATER AND WASTEWATER

- How much wastewater generated per unit of each product or per plant basis?
- How much pollution load is generated per unit of each product (in terms of BOD, COD, Oil & Grease)?
- How much wastewater is blow-down from cooling tower and boiler blow-down per day basis ?
- How much wastewater and waste load generated in terms of BOD, COD, TDS and Oil & Grease for sanitary purpose?
- How much water is consumed from bore well and canal separately TSS, TDS load determination from each cases heavy metals and chlorinated pesticides?

# POLLUTION LOAD ASSESSMENT PROGRAMME IN PETROCHEMICAL COMPLEX - WHERE TO SAMPLE? ( PLANT WISE)



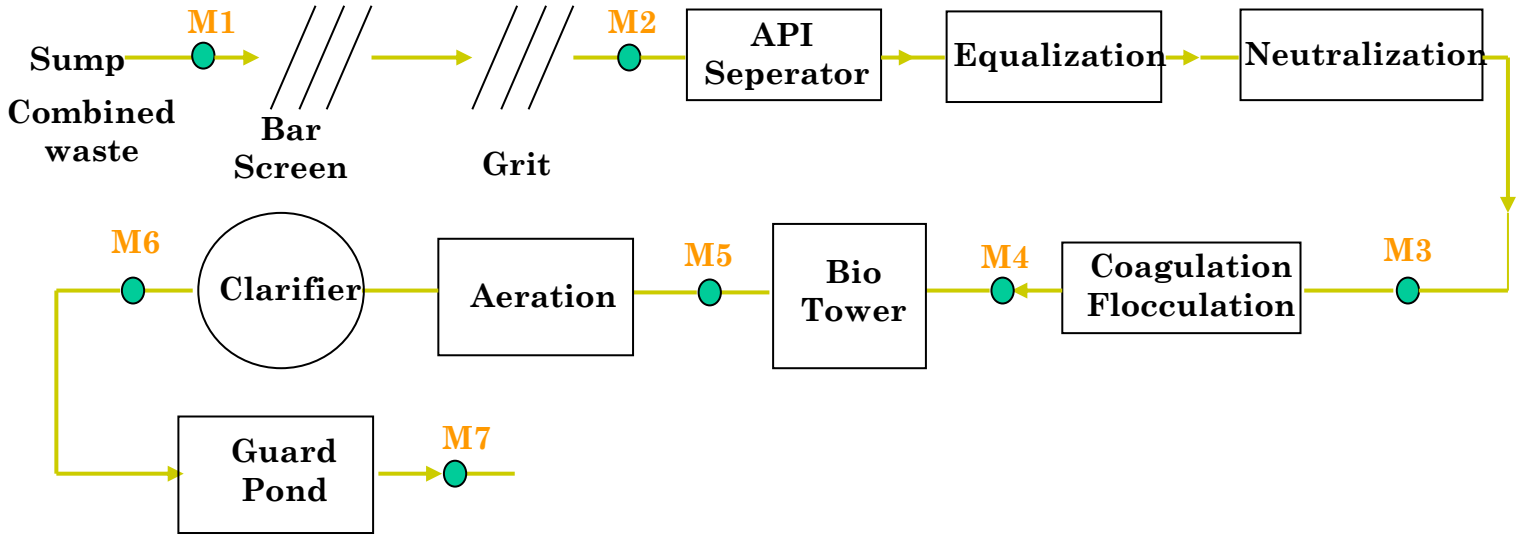
# MONITORING PROGRAMME ON POLLUTION ASSESSMENT (WHEN TO SAMPLE & WHAT TO SAMPLE)

| PLANT | TYPE OF DISCHARGE | FREQUENCY | PARAMETER |
|---|---|---|---|
| GPU | Continuous / intermittent | 3 hours composite for a day (3 days in week) once in each discharge (grab) (3 days in week) | pH, BOD, COD, TDS, O & G, Flow |
| HDPE | Continuous / intermittent | -do- | pH, BOD, COD, TDS, O & G, Flow |
| LLDPE | Continuous / intermittent | -do- | pH, BOD, COD, TDS, O & G, Flow |
| DM PLANT | Continuous / intermittent | 3 hours composite (once in a week) once in each discharge (once in week) | pH, TDS, O & G, Flow |
| CT BLOW DOWN | Intermittent | Once in each discharge | pH, TDS, O & G, COD, BOD, Flow |
| COMBINED WASTEWATER | Continuous | Once in a week (2 hours composite, grab) | Flow, pH, TDS, O & G, COD, BOD, Heavy metals |

# OUTCOME FOR POLLUTION ASSESSMENT

- **COD, TDS, BOD, O & G balance**
- **Load assessment**
- **Quality control chart and costing, fine**
- **Comparison between predicted load and actual load**
- **Waste minimization programme**

# MONITORING NETWORK DESIGN FOR EFFLUENT TREATMENT PLANT PERFORMANCE




| | | | |
|---|---|---|---|
| **M1** | **pH, BOD, COD, O & G, TDS, TSS (2 hours grab & 24 hours composite, every day)** | **M2** | **TSS (grab, once in a week)** |
| **M3** | **pH, BOD, COD, O & G, TSS (grab, once in a day)** | **M4** | **BOD, COD, O & G (once in a day)** |
| **M5** | **BOD, COD, O & G (once in a day)** | **M6** | **BOD, COD, O & G (once in a day)** |
| **M7** | **pH, BOD, COD, O & G, TSS (2 hours grab, 25 hours composite, every day)** | **Aeration Tank - DO, MLSS, MLVSS** | |

# AIR EMISSION ASSESSMENT – THE POSSIBLE INVENTORY

- **What are the possible point sources (channelized) in the complex?**
- **What are the sources of combustion, how much load of particulate matter, sulfur dioxide, nitrogen oxides and carbon di-oxides are generated (in terms of tonnes per day?**
- **What are the sources of conventional parameter from channelized sources of process?**
- **Identification of most probable pollutants from vent off and purge gases.**
- **Budget of fugitive emission.**

# EMISSION PROFILE

| Classification of pollutants | | | Sources of air pollutants |
|---|---|---|---|
| Emissions | Points sources | Combustion | Cracking units |
| | | | Incineration |
| | | | Gen set etc. |
| | | | Flare |
| | | Process | Channelized emissions |
| | | | Vent off |
| | | | Purge gases |
| | Fugitive | VOCs | Equipment leaks |
| | | | Loading |
| | | | Storage tanks |
| | | | ETP |

# TYPICAL PERCENT SHARE OF FUGITIVE DUST EMISSIONS

| S.NO | Source | % Typical |
|---|---|---|
| 1 | Fugitive emissions from equipment | 40-60 |
| 2 | Process vents | 5-15 |
| 3 | Storage tanks | 5-15 |
| 4 | Loading /unloading facilities | 15-25 |
| 5 | WWTP | 10-20 |

# ASSESSMENT OF FUGITIVE EMISSIONS

| S. No. | Equipment type | Process Fluid Service | Average Emission factor in (kg/hr/source) |
|---|---|---|---|
| 1 | Valves | Gas | 0.0056 |
| | | Light liquid | 0.0071 |
| | | Heavy liquid | 0.00023 |
| 2 | Pump Seal<br>Pump Seal | Light liquid | 0.0494 |
| | | Heavy liquid | 0.0214 |
| 3 | Compressor Seal | Gas / Vapour | 0.228 |
| 4 | Pressure Relief Valves | Gas / Vapour | 0.104 |
| 5 | Flanges | Gas / Light liquid / Vapour | 0.00083 |
| 6 | Open ended piping | Gas / Light liquid / Vapour | 0.0017 |

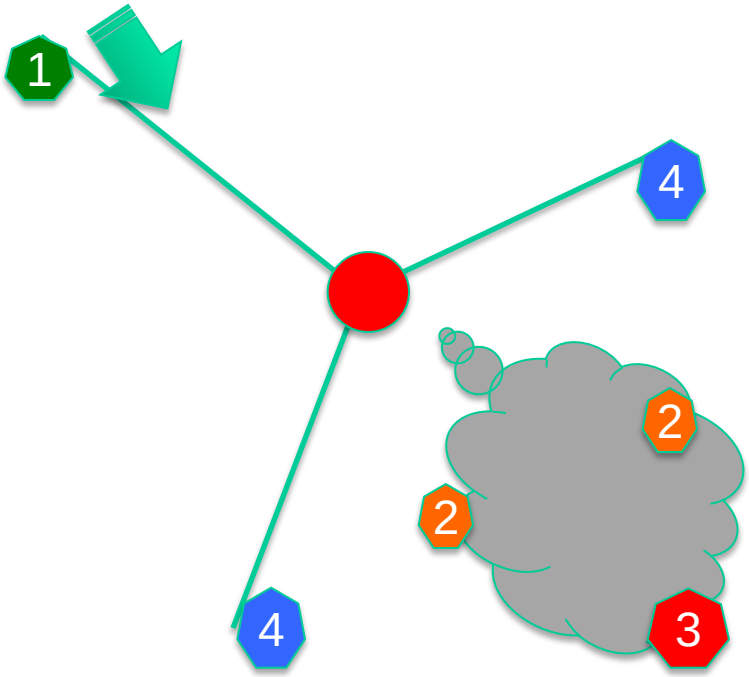
# MONITORING THE IMPACT OF A SOURCE

Local Meteorology

& Topography such as Hillocks should be considered.

**Location of Stations UPWIND & DOWNWIND of a source.**

1. UPWIND / BACKGROUND STATION.
2. STATIONS in AFFECTED area.
3. MAX GLC expected.
4. At least one Crosswind Station is recommended.



# ULTIMATE OUTCOME : THE BALANCE

**Consumption** → **Yield** + **Waste**

- **Raw Materials**
- **Energy**
- **Water**

- **Product**

- **Non-consumption of raw material**
- **Wastewater**
- **Waste heat**
- **Emission of gases, un-burned fuel**
- **Un-recovered product**

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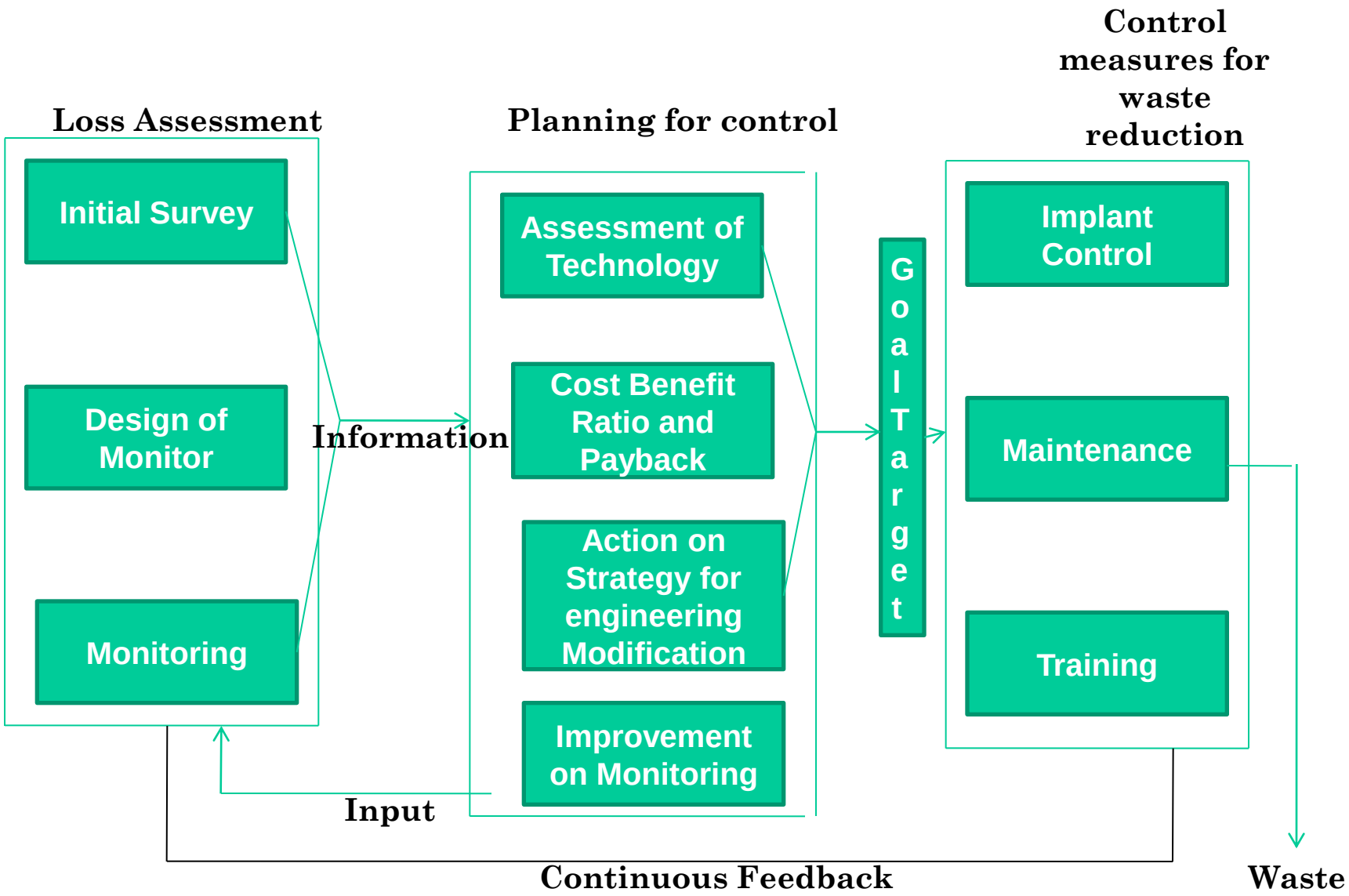
- **Water balance**
- **Material balance**
- **Energy balance**

# Feedback System for Self Regulatory Mechanisms



# 21st century compliance assurance

- Roles and responsibility will increase further: *Need for innovative solutions*
- No thief-police game
- Nation-wide deliberation on self-regulation
- Falsification of data should be dealt seriously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