



# PERFORMANCE MANAGEMENT

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November 2017

# LEARNING OUTCOME & RESOURCES

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## **Learning Outcome**

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- Knowledge on selecting meaningful indicators to measure progress.

## **Resources**

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- REMC Company Handbook.
- ZDHC Chemical Management Systems Guidance Manual.
- ISO 14031: Guidelines for Environmental Performance Evaluation.

## **Workbook**

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Refer to complimentary excercises in your workbook.



# ZDHC REQUIREMENTS



## ZDHC CMS 4.1 Monitor and Measurement

- Process to Monitor Goal Progress

### General Requirements:

Plan and implement the monitoring, measurement, analysis and improvement processes needed to:

- Ensure conformity of the CMS.
- Continually improve the effectiveness of the CMS.
- Include determination of applicable methods, including statistical techniques, and the extent of their use in the plan.





**What problems can occur if you are not measuring your progress?**

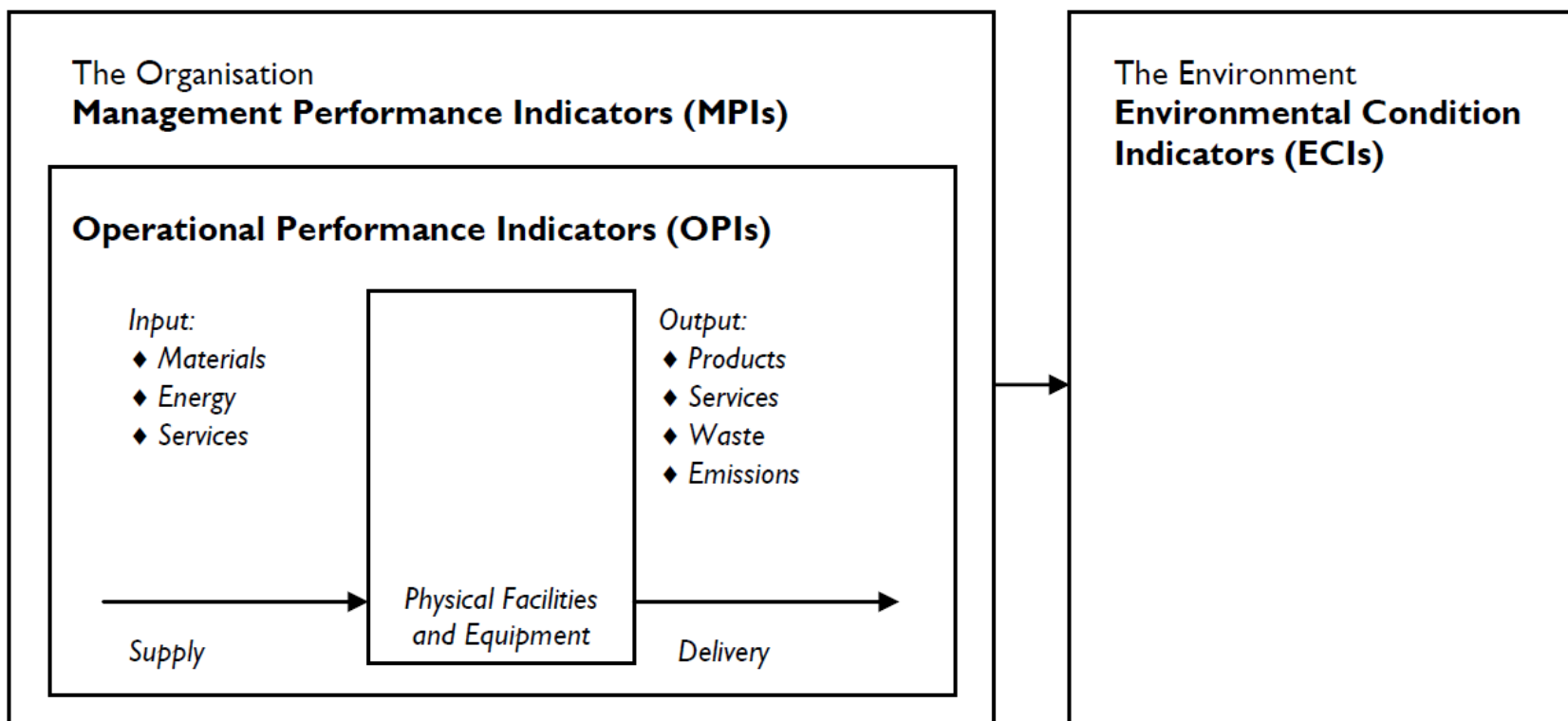


Brainstorm as a group and take notes in your workbook, exercise (17-1).



# SELECTING PERFORMANCE INDICATORS

As per ISO 14031: Guidelines for Environmental Performance Evaluation





## ACCURATE INDICATORS

- **A**ssessable or measurable.
- **C**ontrollable - able to be changed by what you do in chemical management.
- **C**entral and relevant to what you are trying to achieve.
- **U**nderstandable and clear.
- **R**eliable - providing the same measures when assessed by different people.
- **A**ceptable to the users as true indicators of performance.
- **T**imely and
- **E**fficient to monitor.





**What are the benefits of Key Performance Indicators?**



# BENEFITS OF KEY PERFORMANCE INDICATORS (KPIs)

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- Compare resource productivity and environmental/safety/health performance over time.
- Highlight improvement and optimisation potentials.
- Identify and follow up on resource productivity and EHS targets.
- Discover market opportunities and cost-reduction potentials.
- Involve, educate and motivate staff.
- Promote organisational learning.
- Support decision-making by providing concise information about the current status and trends with regard to resource use and performance.
- Implement CMS or EMS and/or generate information needed for your current CMS/EMS.
- Communicate your results to your stakeholders.





# LINKING MANAGEMENT ACTIONS AND PERFORMANCE INDICATORS

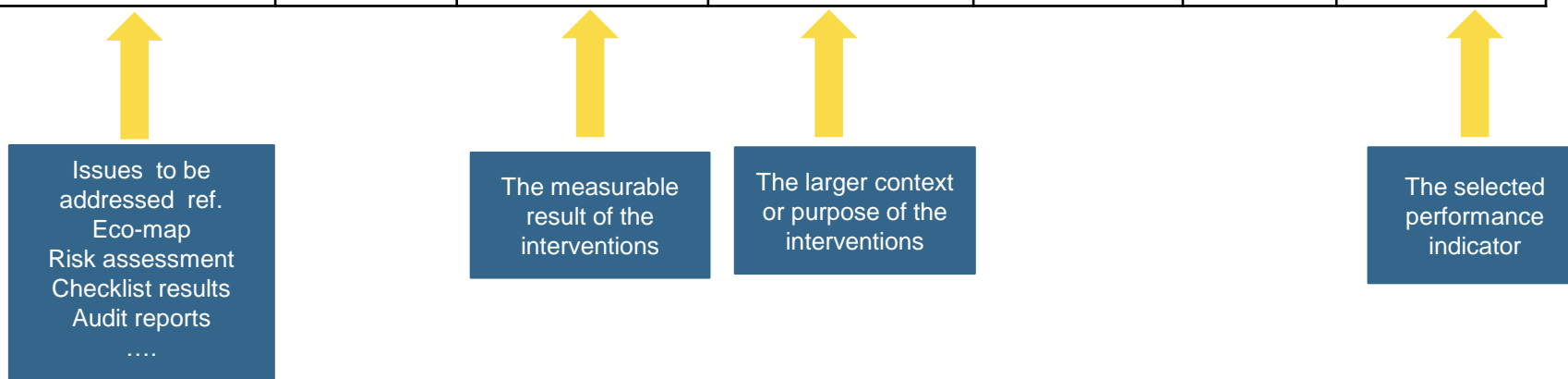


| Measure  | Analyse  | Improve                          | Control |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
|--|--|----------------------------------|---------|--------|--------|--------|-------|--------|--------|--------|---------|---|--------|---|---------|---|-----------------------------------|-------------------------|---------|---|---|---|---------------------------|--|
| <p>1) Describe the Problem</p> <table border="1"> <thead> <tr> <th></th> <th>IS</th> <th>IS NOT</th> </tr> </thead> <tbody> <tr> <td>What</td> <td></td> <td></td> </tr> <tr> <td>Where</td> <td></td> <td></td> </tr> <tr> <td>When</td> <td></td> <td></td> </tr> <tr> <td>Extent</td> <td></td> <td></td> </tr> </tbody> </table> |  | IS                               | IS NOT  | What   |        |        | Where |        |        | When   |         |   | Extent |   |         | <p>4) Identify the Root-Cause</p> <p>5) Analyse Existing Data</p> | <p>9) Determine Best Solution</p> | <p>12) Control Plan</p> |         |   |   |   |                           |  |
|  | IS   | IS NOT                           |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| What   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Where  |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| When   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Extent   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| <p>2) Measure the Magnitude of a Problem</p>   | <p>6) Construct List of Verified Facts</p> <table border="1"> <thead> <tr> <th>Facts</th> </tr> </thead> <tbody> <tr> <td>Fact 1</td> </tr> <tr> <td>Fact 2</td> </tr> <tr> <td>Fact 3</td> </tr> <tr> <td>Fact 4</td> </tr> </tbody> </table> <p>7) Compare Causes to Facts</p> <table border="1"> <thead> <tr> <th></th> <th>Fact 1</th> <th>Fact 2</th> <th>Fact 3</th> </tr> </thead> <tbody> <tr> <td>Cause 1</td> <td>o</td> <td>x</td> <td>o</td> </tr> <tr> <td>Cause 2</td> <td>o</td> <td>o</td> <td>o</td> </tr> <tr> <td>Cause 3</td> <td>x</td> <td>x</td> <td>o</td> </tr> </tbody> </table> | Facts                            | Fact 1  | Fact 2 | Fact 3 | Fact 4 |       | Fact 1 | Fact 2 | Fact 3 | Cause 1 | o | x      | o | Cause 2 | o   | o                                 | o                       | Cause 3 | x | x | o | <p>10) Pilot Solution</p> |  |
| Facts  |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Fact 1   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Fact 2   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Fact 3   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Fact 4   |  |                                  |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
|  | Fact 1   | Fact 2                           | Fact 3  |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Cause 1  | o  | x                                | o       |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Cause 2  | o  | o                                | o       |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| Cause 3  | x  | x                                | o       |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |
| <p>3) Determine when the problem started</p>   | <p>8) Collect additional data until root cause is identified</p>   | <p>11) Verify Solution Works</p> |         |        |        |        |       |        |        |        |         |   |        |   |         |   |                                   |                         |         |   |   |   |                           |  |



# PERFORMANCE INDICATORS AND MANAGEMENT ACTION PLAN

| Improvement Area   | Target   | Objective of proposed measure  | Management Actions   | Person Responsible | Deadline | KPIs to be monitored       |
|--|--|--|--|--------------------|----------|----------------------------|
| Several chemicals cannot be clearly identified due to missing labels | Reduce the number of unlabelled containers to 0% | To improve the company internal hazard communication on chemicals used | Follow procurement policy and store check points to ensure all chemicals to be allowed only if they have proper labels and ensure to protect original label or replace label before it gets deteriorated |                    |          | % of unlabelled containers |





# TYPES OF PERFORMANCE INDICATORS

- Management performance indicators (MPI)
  - 1.1 – 1.8
- Operational performance indicators (OPI)
  - 2.1 – 2.23, 3.1
- Environmental condition indicators (ECI)
  - 3.2 – 3.18





# MANAGEMENT PERFORMANCE INDICATORS (MPI)

| Number | KPI  | Unit | Tracking process (Source)  | Calculation   |
|--------|--|------|--|---|
| 1.1    | No. of internal audits performed                       | No.  | Audit documents  |   |
| 1.2    | No. of external audits conducted                       | No.  | Audits reports   |   |
| 1.3    | No. of NCs identified through all audits               | No.  | Audit reports  |   |
| 1.4    | No. of NCs closed and discussed in MRM                 | No.  | From the minutes of MRM and re-audit reports                                       |   |
| 1.5    | No. of complaints received                             | No.  | Quantity of complaints received (Verbal, digital and written) recorded in register |   |
| 1.6    | No. of incident free days                              | No.  | Incidents log book   |   |
| 1.7    | No. of incidents reported                              | No.  | Incidents log book   |   |
| 1.8    | % of workers trained on occupational and process risks | %    | HR training data   | No. workers trained (year)/No. total workers (year) |



# OPERATIONAL PERFORMANCE INDICATORS (OPIs)

## Chemical Management

| Number | KPI   | Unit | Tracking process (Source)   | Calculation |
|--------|---|------|---|-------------|
| 2.1    | Quantity of chemicals used in year                                    | Tons | Total chemicals purchased – total current stock in tons.                            |             |
| 2.8    | Quantity of hazardous chemicals stored                                | Kgs  | Chemical inventory. Total quantity of hazardous chemicals in stock                  |             |
| 2.9    | No. of unlabelled or label deteriorated due to operation of chemicals | No.  | Internal audits or hot spots identified. Record of the log of hot spots and reviews |             |
| 2.10   | No. of ecotoxic chemicals stored in year                              | No.  | Chemical inventory. No. of chemicals stored in store having label of ecotoxic       |             |
| 2.11   | No. of ecotoxic chemicals stored without proper secondary containment | No.  | Hot spots identification visits and internal or external audits                     |             |
| 2.12   | No. of injuries reported due to chemicals                             | No.  | Accidents or incidents log book   |             |
| 2.13   | No. of relevant staff trained on risk assessment                      | No.  | HR training data  |             |
| 2.14   | No. of staff trained for emergency response                           | No.  | HR training data  |             |



# OPERATIONAL PERFORMANCE INDICATORS (OPIs)

## Chemical Management

| Number | KPI   | Unit | Tracking process (Source)  | Calculation  |
|--------|---|------|--|--|
| 2.18   | Ratio of chemicals used vs hazardous chemicals stored or used in year     | %    | Hazardous chemicals identified from inventory, Chemicals from inventory.                     | Hazardous chemicals/Total chemicals                |
| 2.19   | Quantity of chemicals which were expired or disposed off                  | Tons | Chemicals quantity disposed due to expiry from gate pass, invoices etc.                      |  |
| 2.20   | Quantity of non-product outputs (NPO) generated against annual production | Tons | Quantity of NPO recorded from all activities.  |  |
| 2.21   | Cost of wastewater treatment per year                                     | €    | Cost of waste water treatment per year from accounts information. Invoices and costs on WWT. |  |
| 2.22   | Cost of m3 waste water treatment per ton of production                    | €    | Wastewater treatment cost from invoices  | Wastewater treatment cost/total production [ton]   |
| 2.23   | Cost of NPO per ton of production   | €    | Cost of non-product output against the ton of production                                     | Cost of non-product output/ total production [ton] |
| 3.1    | No. of incidents of RSL per year  | No.  | Register all complaints or test reports failed for RSL                                       |  |



## OPERATIONAL PERFORMANCE INDICATORS (OPIs)

### Water Use

| Number | KPI  | Unit | Tracking process (Source) | Calculation  |
|--------|--|------|---------------------------|--|
| 2.3    | Quantity of fresh water used in year                     | m3   | Flow meter or invoices    | Record of invoices for incoming water or flow meter record |
| 2.15   | % of fresh water used per ton of production in year      | %    | 2.3, Production           | $\text{water use [m3]} / \text{production [Tons]}$         |
| 2.16   | % of waste water generated per ton of production in year | %    | 2.4, Production           | $\text{waste water [m3]} / \text{production [Tons]}$       |
| 2.17   | ratio of fresh water used vs waste water generated       | No.  | 2.3, 2.4                  | $\text{water use [m3]} / \text{waste water [m3]}$          |





## OPERATIONAL PERFORMANCE INDICATORS (OPIs)

### Wastewater and Solid Waste

| Number | KPI   | Unit | Tracking process (Source)   | Calculation |
|--------|---|------|---|-------------|
| 2.4    | Quantity of waste water generated in year     | M3   | Flow meters or estimates or invoices.<br>Quantity entering Equalization tank. |             |
| 2.5    | Quantity of waste generated in year           | Tons | WWTP records or the waste disposed from contractor invoices                   |             |
| 2.6    | Quantity of hazardous waste generated in year | kgs  | Hazardous waste inventory   |             |
| 2.7    | Quantity of solid sludge generated in year    | tons | WWTP records. Total solid sludge (with or without moisture) recorded          |             |



# ENVIRONMENTAL CONDITION INDICATORS (ECI)

| Number | KPI  | Unit | Tracking process (Source)                             | Calculation  |
|--------|--|------|---|--|
| 3.2    | % reduction of incidents of non-compliance to RSL and ZDHC MRSL                  | %    | Incidents of RSL and MRSL from the production record  | $(\text{No. of past incidents} - \text{no. of current incidents}) / \text{no. of past incidents} \times 100$ |
| 3.3    | % reduction of WWTP ZDHC parameters non-conformance                              | %    | Test results and their data of WWTP                   | $(\text{No. of past incidents} - \text{no. of current incidents}) / \text{no. of past incidents} \times 100$ |
| 3.4    | % reduction of hazardous waste   | %    | WWTP waste inventory                                  | $(\text{Qty haz. waste past} - \text{current qty}) / \text{past qty} \times 100$                             |
| 3.5    | % solid waste reduction  | %    | Waste inventory                                       | $(\text{Qty of solid waste} - \text{current qty}) / \text{past qty} \times 100$                              |
| 3.6    | % reduction of hazardous chemicals use   | %    | Chemical inventory and stock data                     | $(\text{Qty haz. chemicals past} - \text{current qty}) / \text{past qty} \times 100$                         |
| 3.7    | % reduction of incidents of priority chemicals detections in waste water reports | %    | Test results of waste water                           | $(\text{No. of detections of priority chemicals in past} - \text{current no.}) / \text{past No.} \times 100$ |
| 3.8    | % reduction of gaps in information of SDS  | %    | SDS and record during assessments                     | $(\text{No. gaps past} - \text{gaps current}) / \text{past gaps} \times 100$                                 |
| 3.9    | % reduction in engineering control related issues                                | %    | Evaluation during the assessments                     | $(\text{No. of past issues of engineering controls} - \text{current issues}) / \text{past no.} \times 100$   |
| 3.10   | % reduction of hazardous substances handling time                                | %    | Hot spot walk through and also from assessment visits | $(\text{Time spent on handling of haz. substance past} - \text{current time}) / \text{past time} \times 100$ |



# ENVIRONMENTAL CONDITION INDICATORS (ECI)

| Number | KPI  | Unit | Tracking process (Source)                                  | Calculation  |
|--------|--|------|--|--|
| 3.11   | % reduction in accidents                                     | %    | measure from accident logs                                 | $(\text{No. Past accidents} - \text{current record}) / \text{previous no.} \times 100$                       |
| 3.12   | % reduction of spill containment                             | %    | measure from the record of accidents from HR               | $(\text{Qty. lost due to spill past} - \text{current qty}) / \text{past qty} \times 100$                     |
| 3.13   | % Productivity increase                                      | %    | measure from the production data and MRM minutes           | $(\text{Current production qty} - \text{past production qty}) / \text{current production} \times 100$        |
| 3.14   | % reduction of normalised energy use                         | %    | measure from energy bills and invoices and production data | $(\text{Past KWh consumed for Kg of production} - \text{Current KWh}) / \text{previous KWh} \times 100$      |
| 3.15   | % hazardous chemicals replaced or substituted                | %    | measure from the chemical inventory                        | $(\text{No. of hazardous chemicals past} - \text{current number}) / \text{past no.} \times 100$              |
| 3.16   | % reduction of solid waste                                   | %    | measure from the solid waste inventory                     | $(\text{Qty of solid waste past} - \text{current qty}) / \text{past qty} \times 100$                         |
| 3.17   | % reduction of hazardous waste                               | %    | measure from waste inventory                               | $(\text{Qty of hazardous waste past} - \text{current qty}) / \text{past qty} \times 100$                     |
| 3.18   | % reduction in incidents of waste water discharge parameters | %    | measure from the test reports of waste water               | $(\text{No. of parameters exceeding limits of WWTP past} - \text{current no.}) / \text{past no.} \times 100$ |

# Open To Questions

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## REFLECTION

Take notes!  
Workbook,  
Exercise (17-2).

Which of these KPIs are you already using?

Which further KPIs could enhance your current reporting system?

# SUMMARY

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Every participant to feedback with one key learning from the session.



Take notes in your workbook, exercise (17-3).



