

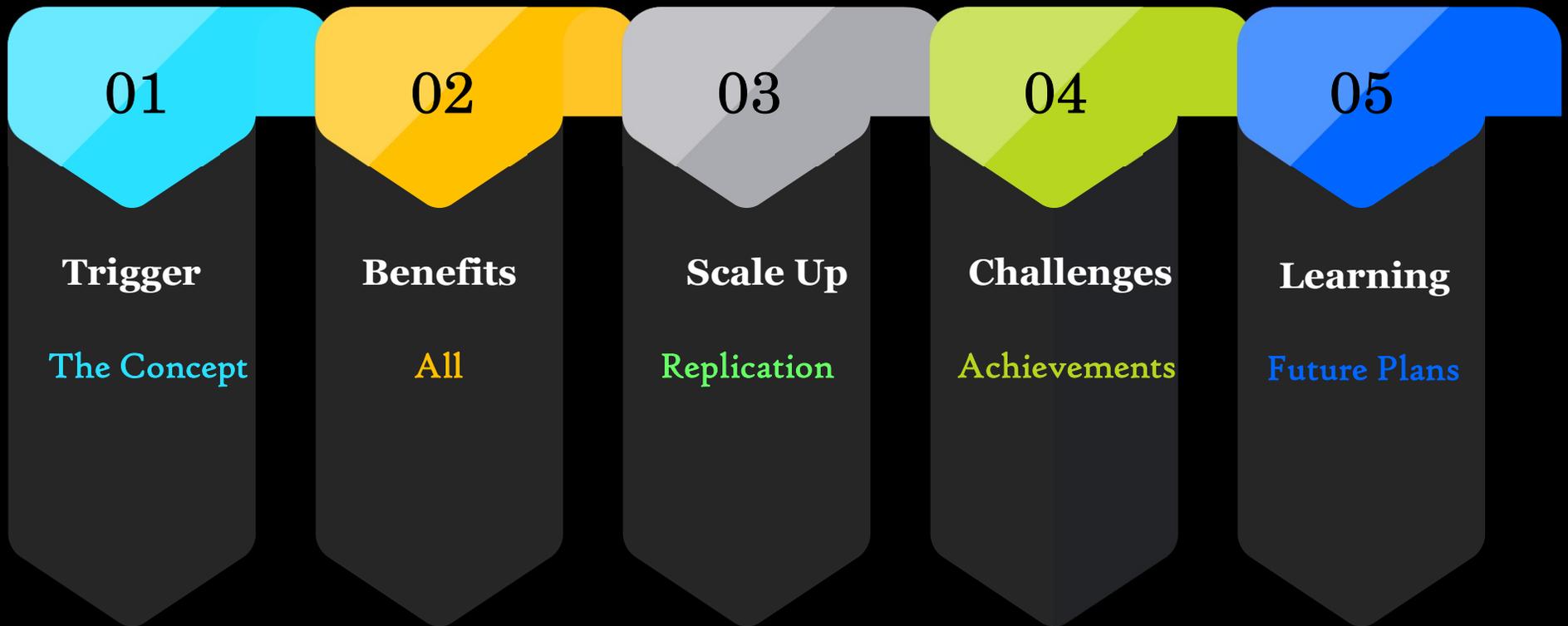


## CII NATIONAL AWARD FOR ENVIRONMENTAL BEST PRACTICES – 2023

RESOURCE OPTIMIZATION: GSU : Oil & Gas (Upstream)  
ONGC, Uran Plant

# CII National Award for Environmental Best Practices – 2023

## Gas Sweetening Unit / Amine Unit



# CII National Award for Environmental Best Practices – 2023

## AMINE UNIT OPTIMIZATION

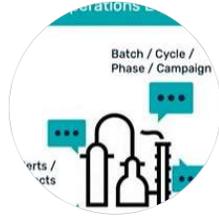


# Trigger



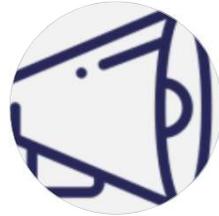
## Conceptualize

- Audit & Ethics Committee (A&EC) in its 144<sup>th</sup> meeting
- ONGC Visit to MRPL



## USP

- Resource Optimization:
  - ✓ **Industry's First**
  - ✓ Digital Twin Led
  - ✓ 1190 days data reviewed
  - ✓ **Without OEM / Licensor**



## Kick off

Oct 2021



## End Date

Mar 10 2022



## Schedule

6 months



## Milestones

- Baseline
- Benchmark
- Cost Benefit Analysis

# CII National Award for Environmental Best Practices – 2023

## Gas Sweetening Unit / Amine Unit

01

Trigger

The Concept

02

Benefits

All

03

Scale Up

Replication

04

Challenges

Achievements

05

Learning

Future Plans

# Tangible Benefits



## Sustainability

- Resource saving
- Utility saving
- Sustainable Digital Technology Framework for sustainable benefits

## Manufacturing

- 18 child projects identified
- 12 shortlisted
- 2 implemented

## Units

- 3 GSU
- Implemented in one

## Savings

- Amine saved
    - 21 ton/h
  - Water saved
    - 66.7 ton/h
  - CO2 saved
    - 0.356 t/h
    - 2847 ton/yr
- Savings per GSU

## Gain

- MDEA saved
  - INR 75 lakh/unit
- **INR 225 lakh per year for 3 GSU**

## Payback

- 5 months
- Based on one unit
- **2 months**
- Based on 3 units

# Intangible Benefits



## Society

- Higher resource efficiency leads to lower carbon footprint leading to better quality of environment in the vicinity of manufacturing site
- **Equivalent of planting 3.4 lakh trees every year**



## Motivation

- Greening of Mother Earth



## Skill

- Technical Services team can now follow this method in short term and on long term create digital nervous system of Energy



## Org Vision

- Achieve higher ESG KPI



## Confidence

- Yes, it can be done. QED..



## Perspective

- Large organizations, like ONGC, can also move nimbly in an economical and yet effective manner to produce significant outcomes of economic gains while achieving global ESG benchmark standards

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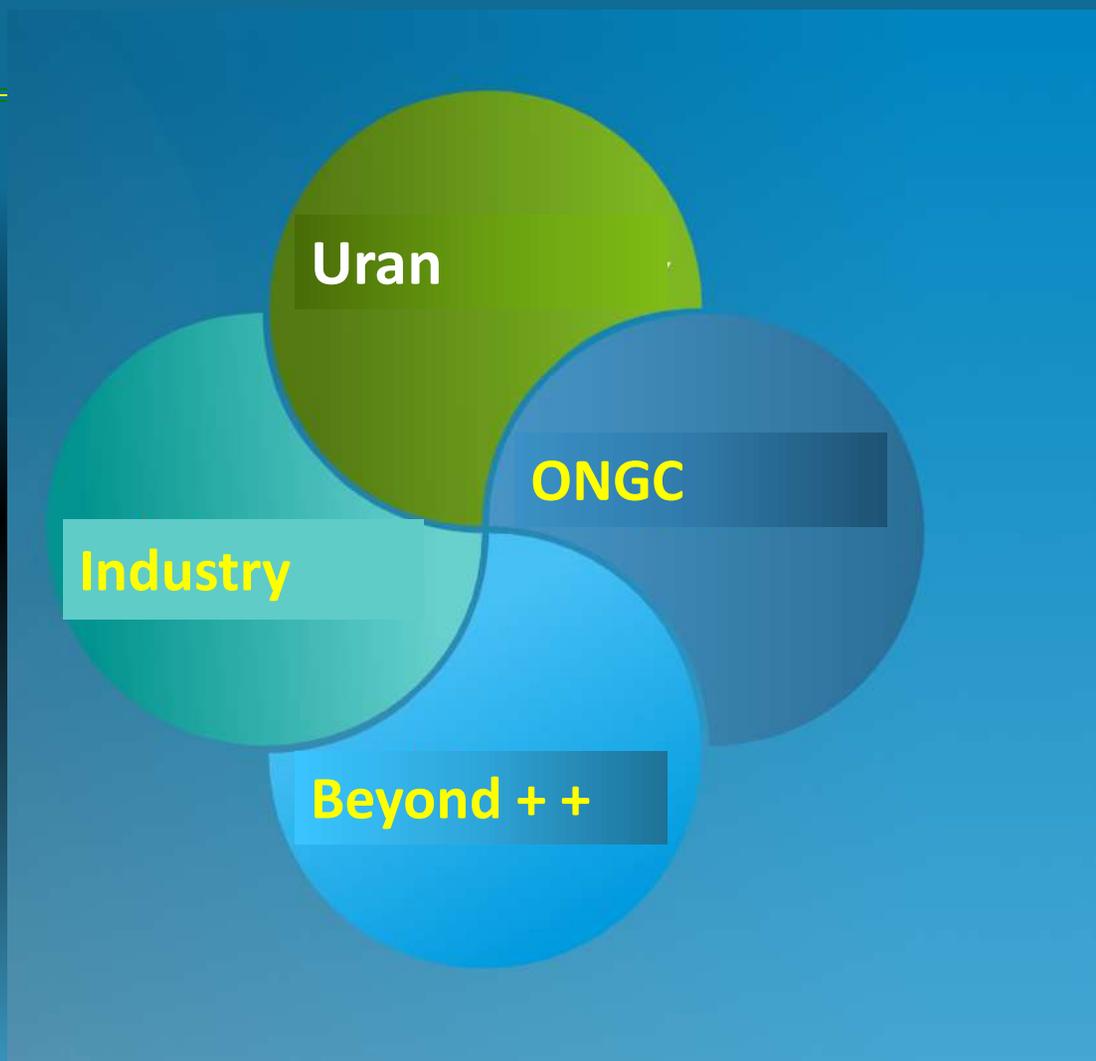
Future Plans

# Replicate

## Scale Up

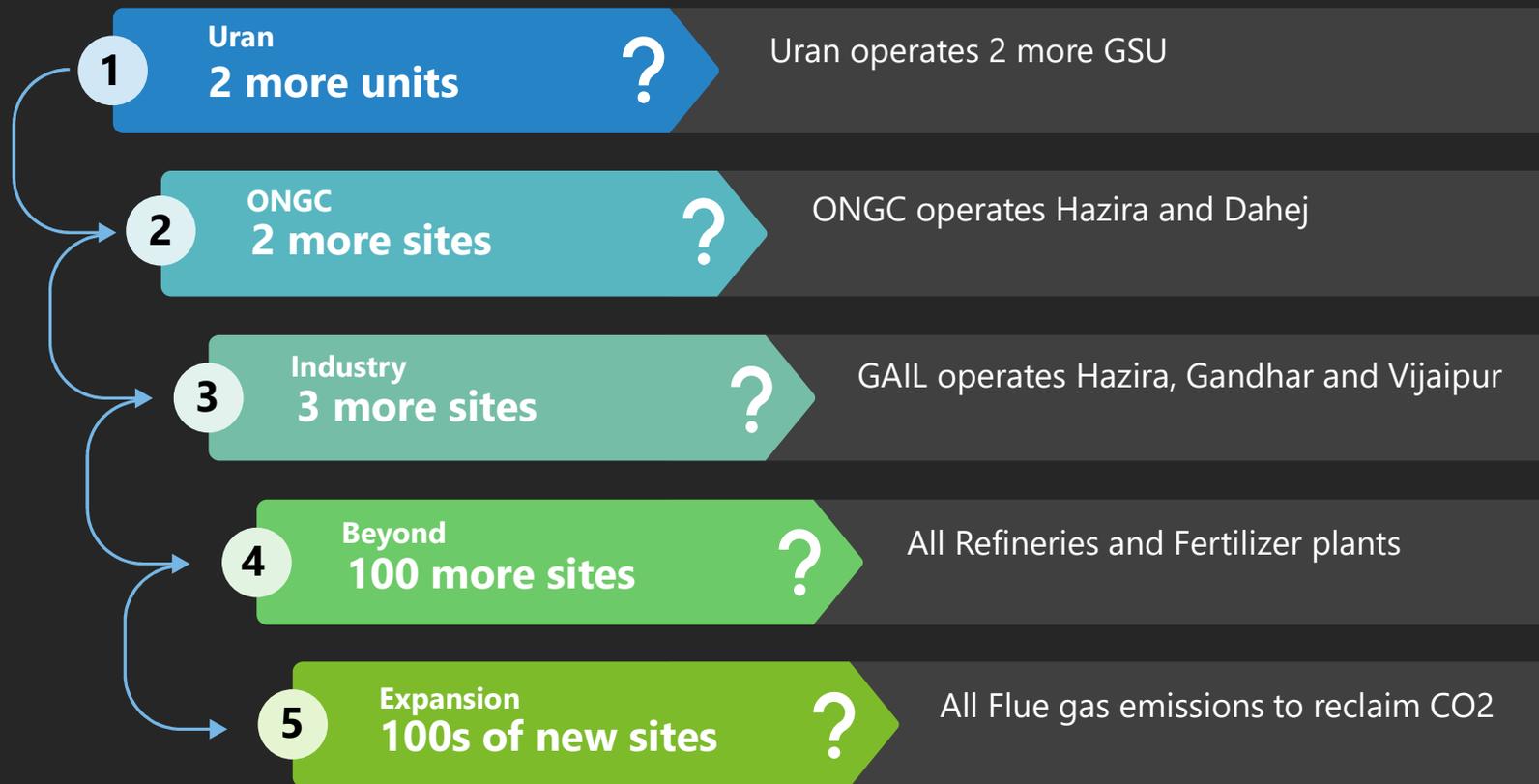
### Steps Initiated

- Report Share
- Presentation to the Executive Committee
- Feasibility study at other units



# Where do we go from here -

**India Focused**



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# Challenges

Data scattered /  
engineering documents missing

01



02

Data not available in  
“Ready to use” format

Convincing Operations

04



03

Validation of Digital Twin

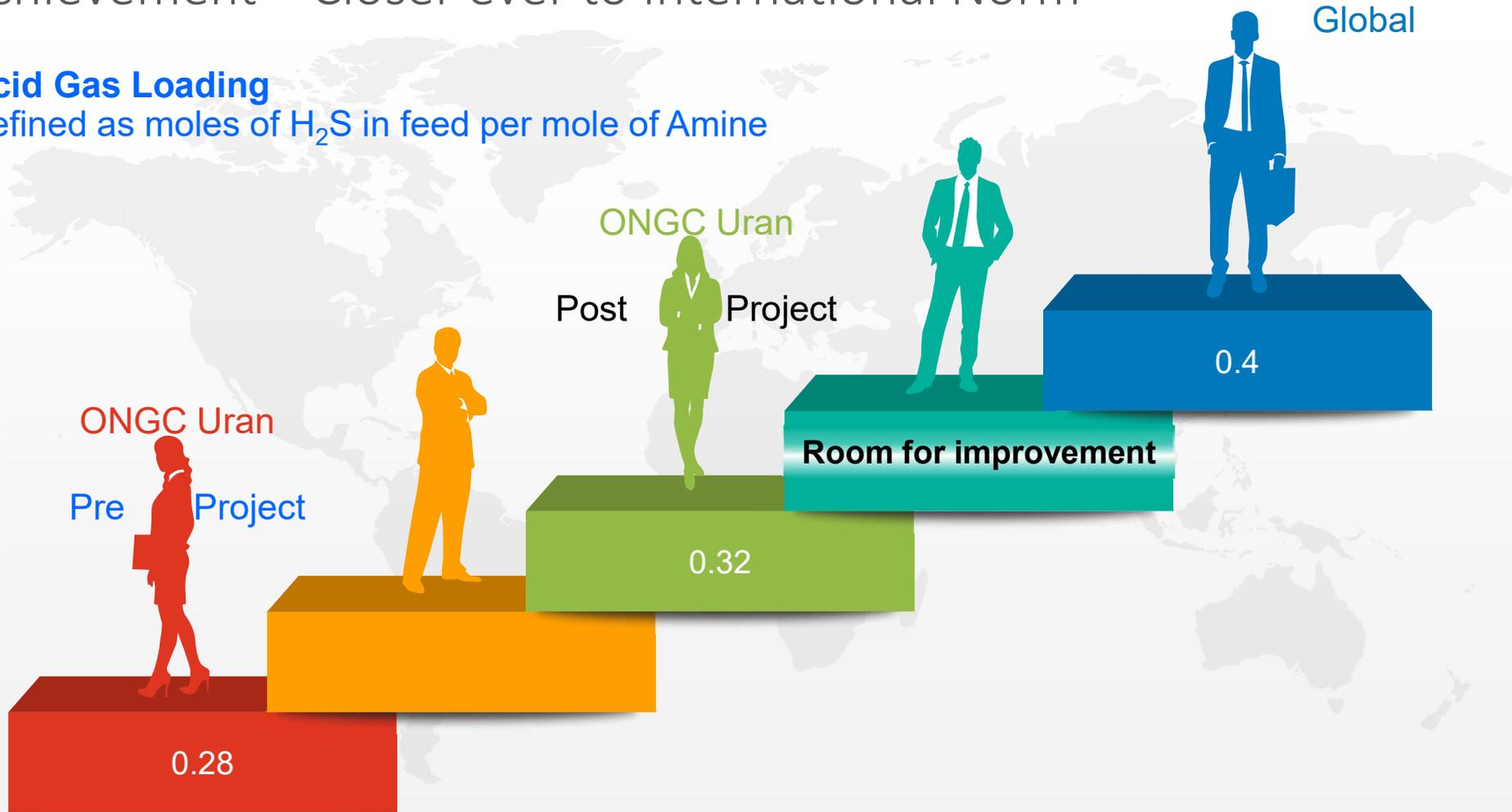
Overcoming Challenges: Long Term Remedy

- Data Templates
- Developed Digital Twin

# Achievement – Closer ever to International Norm

## Acid Gas Loading

Defined as moles of  $H_2S$  in feed per mole of Amine



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# Learnings



Older the units

... Greater the opportunity

Resource Efficiency

Material Savings

.... Opportunities always exist



International norms

...Also work in India



Engineering fundamentals

... Will always deliver



Benefit extraction

... a continuous endeavor

21 t/h  
66 t/h  
.365 t/h

Saved

Amine  
Water  
CO2

