SPEAKER INTRODUCTION

Environmental Protection Continuity

From industrial experience to anticipatory adaptation action

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RESEARCH FOCUS

Environmental protection continuity in high-hazard

Industrial environmental governance

Climate resilience & sustainability

An independent research contribution for technical dialogue.
Not an official UN, UNFCCC, government or corporate position.

From infrastructure disruption to environmental cascade

Two major petrochemical hubs in Iran include more than 20 companies each and depend on shared energy and utility infrastructure.

MAHSHAHR

One central energy / utility infrastructure serving interconnected facilities

ASSALUYEH

Two major energy / utility infrastructures serving interconnected facilities

DISRUPTION

Shared infrastructure failure
→ cluster-wide interruption

Environmental-protection functions under simultaneous stress

- Emergency flaring at multiple facilities
- Potential simultaneous venting of volatile compounds
- Wastewater-treatment, storage or disposal pressure
- Degraded monitoring, containment and coordinated response

Infrastructure failure
→ Utility disruption
→ Environmental cascade

Case description is intentionally anonymized and excludes security-sensitive or site-specific operational information.

Cluster-wide cascading environmental risk assessment

Different petrochemical processes can generate different pollutants—and a shared disruption can concentrate them across the industrial hub.

Petrochemical process	Environmental pathway	Potential pollutants / impacts
Cracking, olefins & aromatics	Shutdown, depressurization, flaring / venting	CO_2e, CO, NOx, VOCs, BTX, soot; air-quality degradation
Chlor-alkali, VCM / PVC & phosgenation	Loss of control, cooling or containment	Chlorine, HCl, VCM and toxic-plume risk; acute exposure
Ammonia, syngas & fertilizer	Pressure, refrigeration or process-control failure	NH_3, NOx and contaminated air; community warning needs
LPG / NGL storage & transfer	PSV lift, release, fire / explosion escalation	Hydrocarbon vapours, VOCs and secondary air impacts
PTA / PET, polymers & wastewater systems	Thermal upset, treatment disruption, runoff / bypass	COD, BOD, TSS, hydrocarbons; water and ecosystem stress

Shared-energy disruption → simultaneous process upsets → multi-pollutant release pathways → cumulative exposure across air, water, ecosystems and communities

The assessment must capture pollutant accumulation and interacting consequences at hub level—not only risk at individual facilities.

Environmental protection continuity as a climate-related risk

The initiating event may be technological or security-related; climate stress can increase infrastructure vulnerability and amplify consequences.

GREENSHIELD ERIF | Five diagnostic layers

01	**Utility continuity**	Backup, autonomy, redundancy and shared-utility dependency
02	**Process safety & containment**	Safe shutdown, isolation, protection layers and containment
03	**Emergency releases & monitoring**	Flare, vent, CEMS, ambient monitoring and event accounting
04	**Water, ecosystem & community**	Wastewater, drainage, receptors, warning and recovery
05	**Governance, data & recovery**	Accountability, mutual aid, exercises, data and finance

Industrial resilience is incomplete if environmental protection fails when critical infrastructure fails.

APPROXIMATELY 50 PROPOSED INDICATORS

Measuring environmental resilience under infrastructure failure

Indicators are proposed for technical review—not a final universal standard or a public ranking.

U	**Utility continuity**	Power, autonomy, redundancy, islanding, black start and shared-utility dependency
P	**Process safety & containment**	Protection layers, shutdown, flare capacity, isolation and containment
E	**Emergency releases & monitoring**	Flare flow, venting, methane/VOC, CEMS and event data
W	**Water, ecosystem & community**	WWTP, storage, drainage, receptors, warning and recovery
G	**Governance, data & recovery**	Ownership, mutual aid, exercises, data and finance

Evidence-based maturity

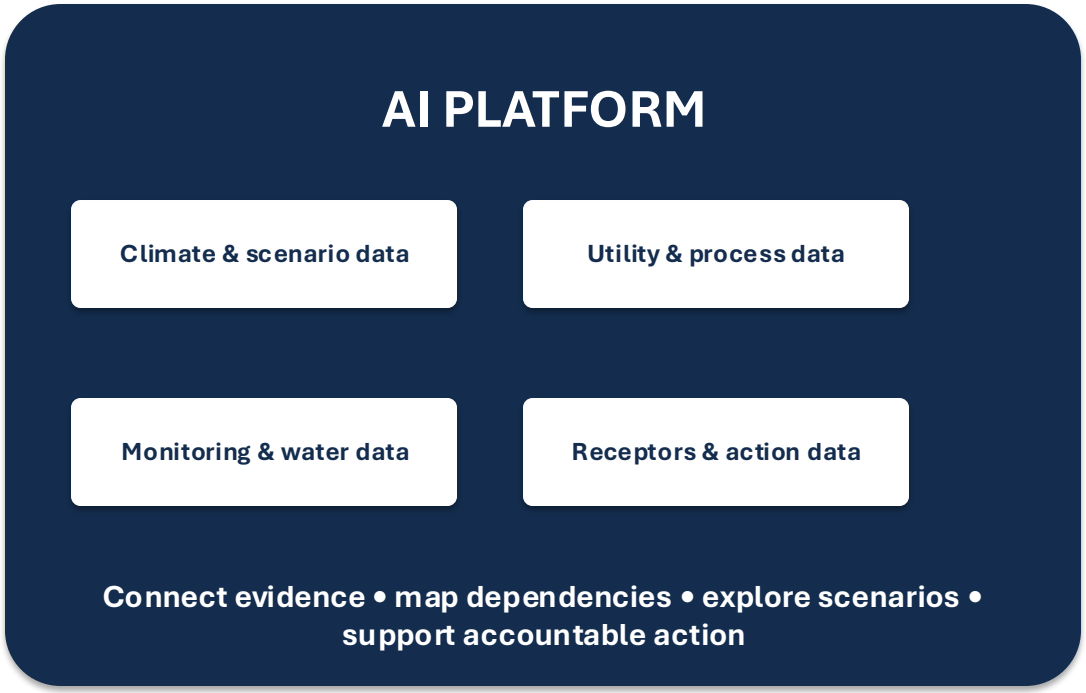
0 Absent	1 Initial	2 Limited	3 Operational	4 Mature	5 Leading

Leila Azari • GreenShield ERIF

From assessment to action

The purpose of scoring is not simply to produce a dashboard. Each weakness should connect to a proportionate, accountable action.

LOW UTILITY SCORE	Backup power • redundancy • islanding
WEAK CONTAINMENT	Isolation • safe shutdown • containment
MONITORING GAP	Flare measurement • CEMS • ambient monitoring
WASTEWATER VULNERABILITY	Emergency storage • drainage isolation
GOVERNANCE GAP	Mutual aid • exercises • clear ownership



AI is a translation layer—not an autonomous decision-maker and not just another dashboard.

A TESTABLE CONTRIBUTION

Case studies, pilots and request for collaboration

INITIAL CASE STUDY

Mahshahr & Assaluyeh

- Cluster-level assessment of shared infrastructure
- Environmental-protection continuity indicators
- Confidential and non-attributive methodology
- No disclosure of security-sensitive details

VALIDATION PATHWAY

Independent review and pilots

- Independent technical review
- Refine indicators and scoring
- Test in additional industrial clusters
- Document lessons for adaptation planning

REQUEST TO THE AC

Technical guidance and collaboration

- Technical and methodological guidance
- Relevant technical and institutional partners
- Voluntary confidential pilots
- Opportunity to present validated progress at COP31, subject to AC priorities

I am not presenting a finished standard. I am proposing a testable contribution that can be refined through technical review, voluntary pilots and international collaboration.