TNI NEMC August 2025

Sustainability in the Lab: What are the Expectations? and What is the Reality?

Sustainability in the Lab:
Navigating an Evolving
Societal Expectation

AGENDA

DISCUSSION POINTS:

1. Sustainability: What is it?
2. History and expectations of our world/society
3. Navigating to meet expectations (Reporting requirements, needs and types of questionnaires)
4. Sustainability/ESG Areas of Focus
5. Realistic approach to the expectations: A plan for a meaningful sustainability program
6. The future of sustainability

SUSTAINABILITY

Caring for and meeting the needs of the **present generation** without compromising the ability of **future generations** to meet their own needs.

Sustainability encompasses broader goals of long-term ecological, social, and economic health.

SUSTAINABILITY

Health, Safety, & Well-being

GHG – Emissions & Energy Efficiency

Equity, Inclusion, and Belonging

Sustainable Waste Management

Reporting and Transparency

Ethical & Sustainable Supply Chain

Our Environment, Resource Use (water) and Pollution Prevention

ENVIRONMENTAL LABS AND THE GREATER GOOD

Environmental laboratories are essential for compliance and identifying contaminants. However, they generate significant waste, consume high amounts of electricity and water, and handle hazardous samples and chemicals. Managing these processes and operations is costly

WASTE

Plastics, glass, chem waste (especially solvents), disposables, expired chems, etc.

HAZARDOUS SAMPLES

Preservation requirements and characteristics of samples.

SAFETY

Use of high volumes of toxic solvents as required by current EPA methodology, use of compressed gases, acids, other chemicals.

ELECTRICITY

1.5X to 5X kWh higher than standard commercial space. (Hoods, makeup air, refrigerators, incubators, etc)

WATER

Significantly higher than standard commercial space – depends on types of equip & processes needing water.

SUSTAINABILITY VS ENVIRONMENT SOCIAL GOVERNANCE (ESG)

SUSTAINABILITY IN BUSINESS

Long-term viability of a company's operations taking into account its environmental, social, and economic impacts

- Sustainable organization thrives economically
- Contributes positively to society
- Reduces its environmental footprint

ESG

Establishes specific criteria used to evaluate a company's performance and behavior in three key areas: **environmental, social, and governance**.

- Three pillars provide a framework to assess a company's management of sustainability risks and opportunities
- Focuses on company's carbon emissions, diversity policies, board structure, ethical business practices, etc.

PRE-INDUSTRIAL ERA
BEFORE ~1800s

- Societies lived within natural limits, using local resources and regenerative cycles.
- Practices like crop rotation, composting, and water management reflected eco-centric living

INDUSTRIAL REVOLUTION
~1800s – EARLY 1900s

- Mass production, fossil fuels, and population growth led to unprecedented consumption.
- Nature was viewed as an infinite resource **exploited** for progress.
- Result: air and water **pollution** and urbanization degraded ecosystems

MID-20TH CENTURY: AWAKENING

1948: International Union for Conservation of Nature (IUCN)
1962: Silent Spring by Rachel Carson exposed concerns about pesticides
1970s: First Earth Day (1970), establishment of U.S. EPA, Clean Air and Water Acts, and global environmental activism.
Growing awareness of limits to growth (e.g., Club of Rome's 1972 report).

SUSTAINABILITY CONCEPT TAKES SHAPE
1980s – 1990s

- **1987:** The Brundtland Report defined sustainability as development that meets present needs without compromising future generations
- **1992:** Earth Summit in Rio led to Agenda 21, climate treaties, and sustainable development goals
  - Shift from environmentalism to integrated thinking: environment, social, and economic

CORPORATE SUSTAINABILTY & ESG EMERGES
2000s – 2010s

- Rise of corporate social responsibility (CSR) and sustainability reporting.
- Frameworks like GRI, CDP, UN Global Compact, and ISO 14001 are common.
- Investors began factoring ESG (Environmental, Social, Governance) into risk assessments.
- Climate science became central; **the Paris Agreement (2015) formalized global climate targets**.

ACTION & ACCOUNTABILITY
2020s - PRESENT

- Climate change, biodiversity loss, and social equity dominate global discourse.
- **Sustainability is now expected, not optional**
- Societal expectations include:
  - ESG transparency
  - Net zero & carbon footprint tracking
  - Ethical labor and inclusivity
  - Circular economy and waste reduction
  - Supply Chain Accountability

Societal Expectations

Society expects organizations to actively reduce greenhouse gas emissions, set science-based climate goals, adopt renewable energy, and adapt to climate risks. **Climate responsibility is no longer optional—it's urgent and expected.**

Stakeholders expect businesses to minimize ecological footprint by managing energy, water, chemicals, waste, and pollution. Protecting biodiversity and practicing resource efficiency are central to environmental stewardship.

Strong, ethical leadership and decision-making culture is expected to guide sustainability growth. **Includes risk management, anti-corruption, board diversity, ESG oversight, and integration of sustainability into strategy**.

Companies are expected to be fair to staff, support the community well-being, and uphold human rights. This includes safe working conditions, fair wages, development, and engagement in social equity.

Transparency is essential. Stakeholders expect clear, consistent ESG disclosures, preferably aligned with global standards (e.g., GRI, CDP, TCFD). Third-party audits and verifications lend credibility and accountability to claims.

There is **increasing demand for sustainable innovation—developing products, services, and processes that reduce harm and create positive environmental or social value.** This includes circular design, green chemistry, and clean technologies.

HOW MANY WAYS CAN YOU BE REQUIRED TO MEET REQUIREMENTS?

- Fortunately/Unfortunately, there are many services to help companies gather all the information
- Each one has their own platform and therefore requires independent access……and duplication of effort

HOW CAN WE SIMPLIFY AND USE THIS TO OUR BENEFIT?

COMPARISON OF COMMON PLATFORMS

Category	EcoVadis	Novata	The Green Project	Ethos	CDP	Integrity Next	My Green Lab*	Customer
GHG Emissions Tracking	T	T	F	T	T	T	T	T
Energy Consumption	T	T	F	T	T	T	T	T
Water Usage	T	T	F	T	T	F	T	T
Waste Management	T	T	F	T	F	F	T	T
Environmental Policies	T	T	T	T	T	T	T	T
Labor & Human Rights	T	T	T	T	F	T	F	T
Diversity, Equity & Inclusion	T	T	T	T	F	F	F	T
Health & Safety	T	T	T	T	F	T	T	T
Ethics & Anti-Corruption	T	T	T	T	F	T	F	T
Supply Chain Transparency	T	F	T	T	F	T	F	T
Data Privacy & Cybersecurity	T	T	F	T	F	T	F	T

*Not verified - generated using AI.

TOP PRIORITIES FOR SUSTAINABILITY/ESG

1 GREENHOUSE GAS (GHG) EMISSIONS & ENERGY EFFICIENCY

Why it matters: Labs are energy-intensive due to equipment, HVAC, and lighting.
Action: Implement energy audits, shift to LED lighting, and use ENERGY STAR-rated equipment, where possible. Explore renewable energy sourcing or offsets.

2 SUSTAINABLE WASTE MANAGEMENT

Why it matters: Labs generate hazardous, chemical, and general waste, which pose environmental and compliance risks.
Action: Establish comprehensive waste segregation, reduction, and recycling programs. Track disposal vendors and compliance.

TOP PRIORITIES FOR SUSTAINABILITY/ESG

3 ETHICAL & SUSTAINABLE SUPPLY CHAIN

Why it matters: Labs depend on chemicals, reagents, and equipment with upstream ESG risks.
Action: Evaluate suppliers for environmental and labor practices. Prioritize vendors with strong ESG credentials and alignment with company expectations. Relevant certifications are a plus.

4 EMPLOYEE HEALTH, SAFETY, & WELL-BEING

Why it matters: Labs have physical, chemical, and biological hazards; staff retention is also a concern.
Action: Maintain robust safety protocols, provide training, and support well-being and career development.

5 EMPLOYEE EQUITY

Why it matters: Equity and equal opportunity, supports innovation, compliance with ESG frameworks, and aligns with customer values.
Action: Track workforce demographics and ensure equal opportunity hiring and leadership practices

TOP PRIORITIES FOR SUSTAINABILITY/ESG

6 ESG REPORTING & TRANSPARENCY

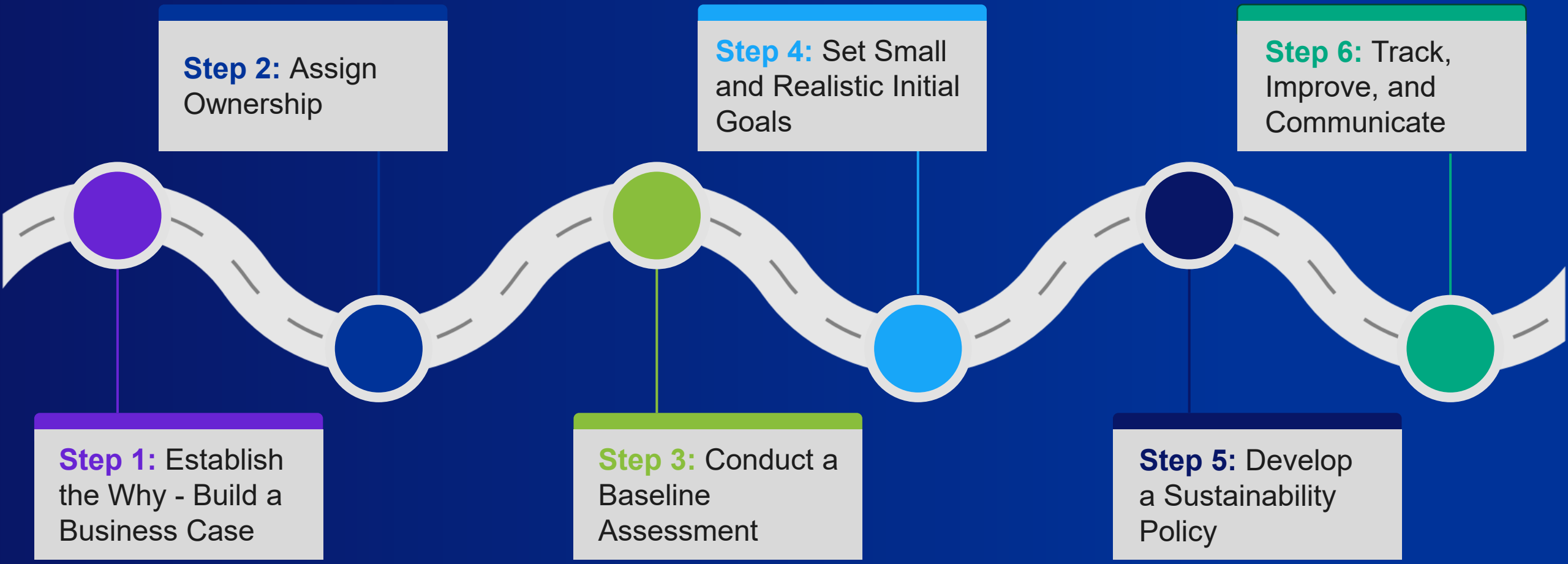
Why it matters: Customers increasingly request verified ESG data for procurement and regulatory purposes.
Action: Standardize ESG documentation, respond consistently to scorecards (e.g., EcoVadis), and publish annual sustainability updates.

7 WATER USE & POLLUTION PREVENTION

Why it matters: Labs often use large volumes of water and may discharge contaminants from processes into the sewer discharge systems.
Action: Monitor water use, optimize lab cleaning and cooling systems, and ensure effluent compliance with permits.

TRANSPARENCY IS KEY IN WASTE MANAGEMENT

A REALISTIC ROADMAP TO SUCCESS



STEP 1: ESTABLISH THE WHY - BUILD A BUSINESS CASE

Understand and communicate **why** sustainability matters for your lab (Examples):

- Meet **client demands** and ESG reporting requirements.
- Improve **operational efficiency** (e.g., reduce energy, water, and waste costs).
- Attract and retain **top talent** who value purpose-driven work.
- Support **resilience** to future regulatory, climate, or resource constraints

STEP 2: ASSIGN OWNERSHIP

Designate an ESG lead or small cross-functional team (e.g., QA, operations, EH&S, HR) to:

- Coordinate efforts
- Track progress
- Respond to external requests

STEP 3: CONDUCT A QUICK BASELINE ASSESSMENT

Use a **simple checklist or scorecard** to evaluate your current practices in:

Area	Example Metrics or Questions
Energy	Do you track lab energy use? LED lighting? Smart controls?
Waste	Do you separate hazardous, recyclable, and general waste?
Chemicals	Are you minimizing or substituting hazardous chemicals?
Purchasing	Do you have green purchasing guidelines?
Social	Are staff trained in safety? Social responsibility?
Governance	Do you have a code of conduct and ethical sourcing policy?

STEP 4: SET A SMALL NUMBER OF INITIAL GOALS

Consider conducting a Materiality Assessment

- Map what's important to clients, regulators, staff, and your lab's performance.

Pick a few SMART goals (Specific, Measurable, Achievable, Relevant, Time-bound), such as:

- Reduce electricity use by 10% over 12 months.
- Eliminate single-use Styrofoam packaging.
- Recycling of single use products
- Elimination of paper printouts (replace with electronic/digital versions)
- Publish a 1-page sustainability policy by year-end.

MAKE SURE GOALS ALIGN WITH CLIENT EXPECTATIONS AND OPERATIONAL VALUE.

STEP 5: DEVELOP A SUSTAINABILITY POLICY

Draft a short document that:

- States your commitment to sustainability
- Highlights focus areas (e.g., energy, waste, ethical sourcing)
- Identifies who is responsible for oversight
- Can be included in RFPs, contracts, and ESG scorecards

Start simple, Don’t overpromise. This becomes your anchor document for external communication and for future expansion of the program.

Too much, too quick, can lead to frustration and perceived greenwashing.

STEP 6: TRACK, IMPROVE, AND COMMUNICATE

Create a basic tracking sheet or dashboard to show goals/progress:

- Share updates with staff through email, bulletin boards, intranets, or other shared communication platforms, to build engagement
- Prepare a short (1-2 page) annual summary (can be internal, public or both)
- This creates excitement and credibility— especially when the program is just beginning…

THE FUTURE OF SUSTAINABILITY IN THE LAB

UTILITIES

ADVANCED TECH

- Reduce energy consumption: adaptive ventilation systems, variable air volume fume hoods, demand based controls

CIRCULAR RESOURCE MGMT

WORK TOWARD ZERO WASTE

- Material reuse and recycling programs (esp. plastics).
- Green chemistry approaches to minimize hazardous waste.
- Closed-loop water systems and recirculation for equipment (i.e. autoclaves & chillers)

DATA DRIVEN OPTIMIZATION

MONITOR/ADJUST

- Smart building systems, sensors, and AI-based analytics allow continuous feedback and real-time energy management..
- Scorecard focal areas and advancements

CULTURAL SHIFT

STAFF

- Sustainability embraced by lab employees,
- Lab users receive feedback on their resource use, fostering behavioral change.

THANK YOU!

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