



Environmental Sustainability

My Green Lab at Novartis

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My Green Lab (MGL)

Building a Global Culture of Sustainability in Science.

Green Lab Certification Named Key Player in the UN Climate Change's Race to Zero



We are proud to announce that our Green Lab Certification has been selected as a key indicator of progress for the United Nations Climate Change High Level Climate Champions 2020. It is the only Green Lab Certification program in the world and is the only Green Lab Certification program that has been selected as a key indicator of progress for the United Nations Climate Change High Level Climate Champions 2020.

Green Lab is the only global green lab certification - helping you save money - including on energy, water, waste, and more. It is the only global green lab certification - helping you save money - including on energy, water, waste, and more.



WHY DO WE NEED GREEN LABS?

Laboratories are resource-intensive spaces.



More energy than
office spaces



More water than
office spaces



Metric Tons of
plastic waste each
year
(12 billion pounds)

www.mygreenlab.org

My Green Lab at Novartis

- Novartis has committed to be a “Global Leader in Environmental Sustainability”
- Since 2015, My Green Lab non-profit organization has developed a “green lab certification” process that is increasingly adopted worldwide
- UN Race to Zero, signed by Novartis in sept 2021, is recognizing MGL as the 2025-2030 breakthrough tracker for Pharma industry sector: *“95% of labs across major pharma and med tech companies are My Green Lab certified at the green level by 2030”*



My Green Lab certification program

Creating a culture of sustainability through science.

1x



1. Assess Baseline

- Survey lab members to understand current practices
- Make recommendations for improvement



2. Make Changes

- Labs discuss solutions and implement behavior change practices
- Labs and Green Teams coordinate additional work



3. Get Certification

- Re-assessed lab practices
- Certification level given
- Make recommendations for further improvement based on progress

Recertify
Every 2 years

13 topics assessed

Energy & Climate



Infrastructure
Energy



Plug Load



Fume Hoods



Large
Equipment



Cold
Storage



Travel

Circular Economy



Vivaria



Resource
Management



Green
Chemistry



Recycling &
Waste Reduction



Purchasing



Water

+ R&D Plastic

Integrated into MGL questionnaire with 12 questions corresponding to topic able to reduce the R&D plastic footprint: supply choice, behaviors, practices, tools & recycling,

Community



Expected Results



IMPROVED ENVIRONMENTAL FOOTPRINT

Supporting the change to a
MORE RESILIENT BUSINESS MODEL

MINDSET & CULTURE CHANGE

Lab associate adopting ES as an automatism doing and thinking

COLLABORATION

Connecting the dots and exploring synergies

RESOURCES SAVING

Energy, water, waste, raw material... and \$\$ when possible

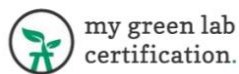
INNOVATION & RESILIENCE

Exploring new process, Technologies, methods, etc ; Decreased env. dependencies

- KPIs essentially qualitative
- Contribution to quantitative ES savings known poorly monitorable

MGL sample feedback report

Scoring panel



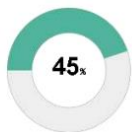
Assessment Feedback Report

Your Lab

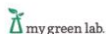
Your Organization

Thursday, November 18, 2021

Your Assessment Score:



40(100% (8 people) of your lab responded to the survey)



A section overview

Waste Reduction and Recycling



45%

Answer Distributions

	Does Not Apply	I Don't Know	Never / No	Sometimes	Frequently	Always / Yes	Overall Score
We have recycling bins for our lab materials	13%	13%	13%	63%			72%
We know what materials can be recycled in the lab and...	13%	25%		63%			76%
We take advantage of product/material return programs...		50%		13%	25%	13%	24%
We use take back programs for packaging in our labs		63%		13%	13%	13%	23%
We preferentially select suppliers who offer product a...		50%		38%		13%	7%
We recycle gloves when feasible			75%		13%	13%	3%
We have conducted a waste audit to identify our biggest...		38%		38%		25%	27%
We have implemented solutions to minimize the lab's...		38%		50%		13%	15%
We recycle batteries that can be recycled		50%			50%		51%
We use a reusable alternative to ice or dry ice	13%		50%		25%	13%	25%
We recycle solvents when possible		38%		50%		13%	15%
We repurpose, surplus, or donate equipment, supplies...	25%			50%		25%	34%
We reuse disposable plastic and glass items and mini...		50%		13%		38%	66%
We understand the labeling requirements for the differ...	25%				75%		88%
We throw only biohazardous waste into the biohazard...		38%			63%		89%
We have guidelines for separating chemical waste streams		25%	13%		25%	38%	51%
We have guidelines for separating hazardous waste fr...	13%		38%		50%		69%

Strategies To Improve

Congratulate yourself for a great start in a difficult category - waste and recycling is often confusing and frustrating, but with a little effort and the suggestions below your lab will be earning top marks.

- Once you're clear with EHS and facilities on recycling regulations, make sure you have convenient bins for recycling (at least paper and cardboard) in your lab.



MGL sample feedback report

Section related proposals

- Make posters, hold a meeting, or send an email to ensure that your group is aware of the items that can be recycled - and where they are to be collected - in your lab.
- Use manufacturer 'take back' programs, such as those for pipette tip boxes, as well as programs which accept used packaging.
- Try to buy specifically from manufacturers that offer programs to reuse or recycle goods and packaging. Remember, you are voting every time you spend a dollar - make sure your support is heard.
- If feasible for your institution, look into recycling gloves. Logistics vary and safety measures will need to be taken, but glove recycling continues to be an effective engagement program in lab sustainability.
- Conduct a simple audit of your lab space to get a better idea of the types and quantities of waste you're producing. Involve your waste/facilities group, as well as safety, and use our [handy template](#) if you like!
- Once you know your lab's largest and most impactful waste streams, implement measures to minimize or even eliminate them. For example, if you see a lot of packaging waste, evaluate your purchasing and organization strategies to ensure you are acquiring materials efficiently.
- Set up a station for recycling batteries, and ensure they're taken to the proper collection site regularly.
- Look into alternatives for ice or dry ice, such as Lab Armor beads, freezable tube holders, or ever reusing gel packs!
- Acetone, Xylene, and Acetonitrile are just a few of the solvents that can be easily recycled to >99% purity. Look into recycling solvents, either by using one at your institution or purchasing your own.
- When your lab has extra equipment, supplies or chemicals, look for ways to donate them to other researchers. Waste and EHS can help you internally, or look for external options like Rheaply! Here is how your lab reports they are repurposing materials today:
 - 5% - Lab equipment
 - 5% - Lab supplies (consumables, chemicals)
 - 5% - Lab furniture
 - 10% - I don't know
- Reuse plastic and glass items that are meant for single use when you can, such as centrifuge tubes or HPLC vials.
- It's very important to understand the guidelines for sorting all waste in your lab, but especially hazardous and chemical items. Ensure that you only dispose of hazardous waste in the biohazard/burn bin, as improper sorting leads to more resources and energy being used to separate and dispose of materials and chemicals downstream.

Learning elements

Green Chemistry



18%

After decades of global environmental disasters, human health crises and toxic spill events, scientists in the late 20th century conceived the concept of Green Chemistry – defined as “**the design of chemical products and processes that reduce and/or eliminate the use or generation of hazardous substances**”.

The 12 Principles of Green Chemistry provide a framework for evaluating and minimizing the life cycle impacts of a product or process.

- | | |
|-----------------------------|----------------------------|
| 1. Pollution Prevention | 2. Atom Economy |
| 3. Less Hazardous Synthesis | 4. Design Safer Chemicals |
| 5. Safer Solvents | 6. Energy Efficiency |
| 7. Renewable Feedstocks | 8. Reduce Derivatives |
| 9. Catalysis | 10. Design for Degradation |
| 11. Real-Time analysis | 12. Accident Prevention |

Take it a step further!

- ✓ [Beyond Benign](#) - nonprofit group focusing on educational resources
- ✓ [ACS Industry Roundtables](#) - convenes global companies to advance the implementation of green and sustainable chemistry and engineering
- ✓ Check out Green Chemistry/Engineering programs at these [institutions worldwide](#)
- ✓ Sign up to use [Millipore Sigma's DOZN tool](#), which will help to effectively plan your synthesis and other experiments sustainably
- ✓ Share your green chemistry solutions with us - send us your ideas to programs@mygreenlab.org



Swap toxic items for less toxic

Exchanging mercury thermometers and discontinuing ethidium bromide use for gels are just a start to the ways your lab can cut back on harmful chemicals, reagents and precursors.



Substitute and Recycle Solvents

Our best practices [guide](#) breaks down available selection tools to help choose greener solvents. Many solvents (Acetone, Acetonitrile, and more) can be efficiently distilled back to + 99% purity using solvent recyclers and vendors.



Share Chemicals and Reagents

Many labs contain chemicals which are unused that could be valuable to others. Talk to your organization about hosting a chemical share/swap event, to ensure these valuable items are utilized by your peers.



Stay Informed and Engaged

Keep talking to your lab mates, managers, PIs, EHS personnel and more about your desire to incorporate Green Chemistry principles into your lab. Use our [discussion guide](#) as starting point!

Want to take a deeper dive?
Check out [MGL's Accredited Professional course!](#)





Novartis Pilot Results 2021

MGL pilot KPIs

% of MGL survey completion



509/812
respondents

Source*:
MGL report

% Lab increasing score



24/24 lab

Source*:
MGL report

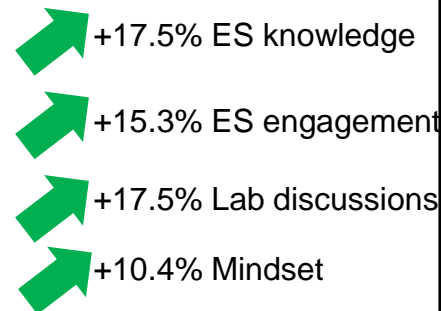
Approval rating from participants



from 349
respondents

Source*: Novartis
Survey Q11

Survey score increase



Source*: Novartis
Survey Q4-8

MGL 2021 pilot conclusion

- Pilot Novartis certification result: Gold
- Indicators show
 - MGL is improving ES knowledge, culture, engagement and actions
 - Majority of feedback is positive
 - Vast majority of participants find MGL valuable and a good program to drive ES within labs
- Working with MGL team was easy.
- Learning: MGL certification is structuring lab ES efforts but to be successful and transformative, it needs a whole network to organize and support (inc. working time).