

MADE-IN-ABA SOLAR LANTERN



"Upcycling Plastic & E-wastes into Sustainable/Affordable Solar Lanterns"

By Young Innovators' of Sparkwise Student Team

PROJECT NAME: MADE-IN-ABA SOLAR LANTERN

BIG IDEA: Sustainable and Affordable Solar Light .

ESSENTIAL QUESTION: "How can we turn plastic and electronic waste into affordable solar light solutions for energy-poor rural students sustainably?"

TEAM MEMBERS: Judith Felix; Fortune Joshua; Golden Marcus.

SCHOOL: Sparkwise Initiative/Springfield International Academy.

LOCATION: Aba, Abia State, Nigeria.



Our team displaying prototype of locally made solar lanterns.

ENGAGE:

The challenge our project address

Our project addresses the challenges of energy poverty, plastic and electronic waste pollution, and limited access to safe night-time lighting in underserved school communities in Aba, Abia State. These interconnected issues restrict students' learning opportunities, weaken local resilience, and contribute to environmental degradation and unsafe reliance on fossil-fuel lighting alternatives.

https://drive.google.com/file/d/1e1iSxxl1alwEKXgcPjywwwh_QN_zrL8C/view?usp=drivesdk



Young Innovators Upcycling Damaged electronics and plastic waste into affordable solar lanterns.

Why our team selected this topic or challenge?

We selected this challenge because energy poverty and waste pollution directly affect our school community in Aba. By transforming discarded materials into solar lanterns, we create practical local solutions, strengthen STEM skills, promote environmental responsibility, and inspire youth-led sustainable innovation.

<https://youtu.be/bYcNKsMcxvI?si=zpXXD7FleSH8KPjA>



We created a solution to replace hurricane lamp with our solar lantern to improve night study.

How it is a real-world problem or concern?

Plastic and electronic waste pollute our environment, while unreliable electricity limits students' study time and household productivity. Dependence on kerosene and fossil fuels increases health risks and carbon emissions. These interconnected challenges affect education, livelihoods, and climate resilience, making sustainable solutions urgent and essential.

<https://drive.google.com/file/d/1030tP8N9dpCE9JRjifapwVVwq3OhhVT0/view?usp=drivesdk>



Working prototype: Transforming plastic and electronic wastes into Clean Energy

INVESTIGATION

What our team learned and discovered as part of our investigations.

We discovered many students lose 2–4 study hours nightly due to frequent grid failures, while over 60% of households rely on kerosene lamps, increasing costs, indoor air pollution, and carbon emissions in our community.

<https://drive.google.com/file/d/1wf4cE8wRnrfp3TkMeSGcNr4DsfbmPk0G/view?usp=drivesdk>



School Children Admires our solar lantern over the eye-burning kerosene lamp

Still on our journey of Investigation

Our waste audit showed large volumes of discarded plastics and broken electronics in local markets and homes, revealing recoverable materials that can be redesigned into affordable solar lanterns, reducing pollution while expanding clean energy access.

<https://drive.google.com/file/d/1YYPK1dvWaq1MIIT4hxd0vJK8tySbLxQB/view?usp=drivesdk>



Broken Electronics gathered from our local markets and values created from them.

ACTION

Our Solution Concept: Made-In-Aba Solar Lantern

We designed a locally built solar lantern made from recycled plastic and e-waste to address energy poverty and pollution. The lantern integrates solar panels, rechargeable batteries, and efficient LEDs with protective circuitry for durability, safety, and extended performance in off-grid rural homes.

<https://drive.google.com/file/d/1nLDqACd98vifQbFEYXZpnnPdUVRx9VDp/view?usp=drivesdk>



Our team collaborating to design and innovate efficient Solar Lanterns

Actions Taken & Creative Technology Outputs

✓ We conducted waste audits, built and tested prototypes, and distributed pilot lanterns to students.

✓ We documented data on study-hour improvements, created a short explainer video, and developed a simple digital project portfolio showcasing designs, impact metrics, and user feedback for continuous innovation.

<https://drive.google.com/file/d/1ij4XtAlzwrxLA45sRYj-v2yGJDn8MkuY/view?usp=drivesdk>



Our team collaborating to refine our prototype solar lanterns into marketable standard.

Mission:

To build affordable solar solutions from recycled waste while empowering underserved students through hands-on STEM and climate innovation.

Vision:

Youth-led communities where clean energy, circular practices, and innovation drive sustainable development.

Goals:

Reduce waste, expand safe night study lighting, strengthen STEM skills, promote environmental responsibility, and scale student-built clean energy solutions.

<https://drive.google.com/file/d/1O9QKlw1AjzdwDgsUhAhLrQLTcvNwosA/view?usp=driveclk>



Our Team in Springfield International
Academy STEM Exhibition

SUSTAINABILITY PLAN

Train more students in solar assembly and recycling, expand our school-based tech hub for waste collection and prototyping, reinvest lantern sales into materials and training, and build partnerships with schools and community leaders for long-term impact.

MAJOR STAKEHOLDERS

- ✓ Sparkwise Students team
- ✓ Sparkwise Teachers
- ✓ Rural households
- ✓ Local recyclers
- ✓ Clean-energy advocates



Some of our stakeholders

MEASUREMENTS OF IMPACT

Number of solar lanterns produced and distributed, quantity of plastic and e-waste upcycled, increase in students' night study hours, reduction in kerosene use, and number of students trained in STEM, clean energy, and circular economy practices.

For more info:

<https://www.linkedin.com/company/sparkwise-initiative/>

<https://www.youtube.com/@SPARKWISEINITIATIVE>

<https://www.facebook.com/profile.php?id=61567165610224>

<https://www.linkedin.com/in/ebenezer-anyadiegwu>

<https://vm.tiktok.com/ZSHKNQGBqBJbk-dsOqe/>

<https://www.instagram.com/sparkwiseinitiative>

CONCLUSION

What if every discarded plastic bottle or broken electronic component could become a source of clean light for a student's future?

Join us in advancing the Made-In-Aba Solar Lantern movement—where waste becomes opportunity and innovation fuels education.

Together, we can transform challenges into sustainable solutions.

