



FROM FIREWOOD TO MODERN BIOENERGY

LEAPFROGGING THE FOSSIL AGE

The case of school cooking



BioMassters
The Clean Cooking Solution

School Cooking With Biomass Pellets

Pilot at EPA St. Michel Nyamirambo In collaboration with BioMassters and World Bioenergy Association



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About BioMassters



- Rwandan company, founded in 2020
- Aims to replace charcoal and firewood for cooking
- Distributed 6,500 stoves - urban focus
- Impact: Mitigates climate change, reverses deforestation, and reduces indoor air pollution
- Manufacturing plant in Rubavu that transforms waste wood into pellets
- Retail network in Kigali, where stoves are also assembled
- Offers customer service, training, stove repairs, and after-sales support
- Plans to expand market share and increase production capacity in 2025/26



The role of institutional cooking in schools in Rwanda

- Approximately **1/3** of the population in Rwanda is going to school
 - Around **4000** schools with an average of 1000 students
 - School meals are a key factor for nutrition of the population!
 - School kitchens use almost exclusively firewood today
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Pilot Overview

In Sep/Oct 2024, BioMassters and WBA conducted a 4-week pilot at EPA St Michel, replacing firewood with wood pellets.

Objective: Change the fuel source by adding a pellet burner to two existing “muvelo” stoves without altering the stoves to keep costs low.

Focus: Compare fuel use, indoor air pollution, and costs between baseline and retrofit scenarios.



Final Outcomes



Reduced wood use



Smokeless kitchen



Low investment costs



Improved convenience

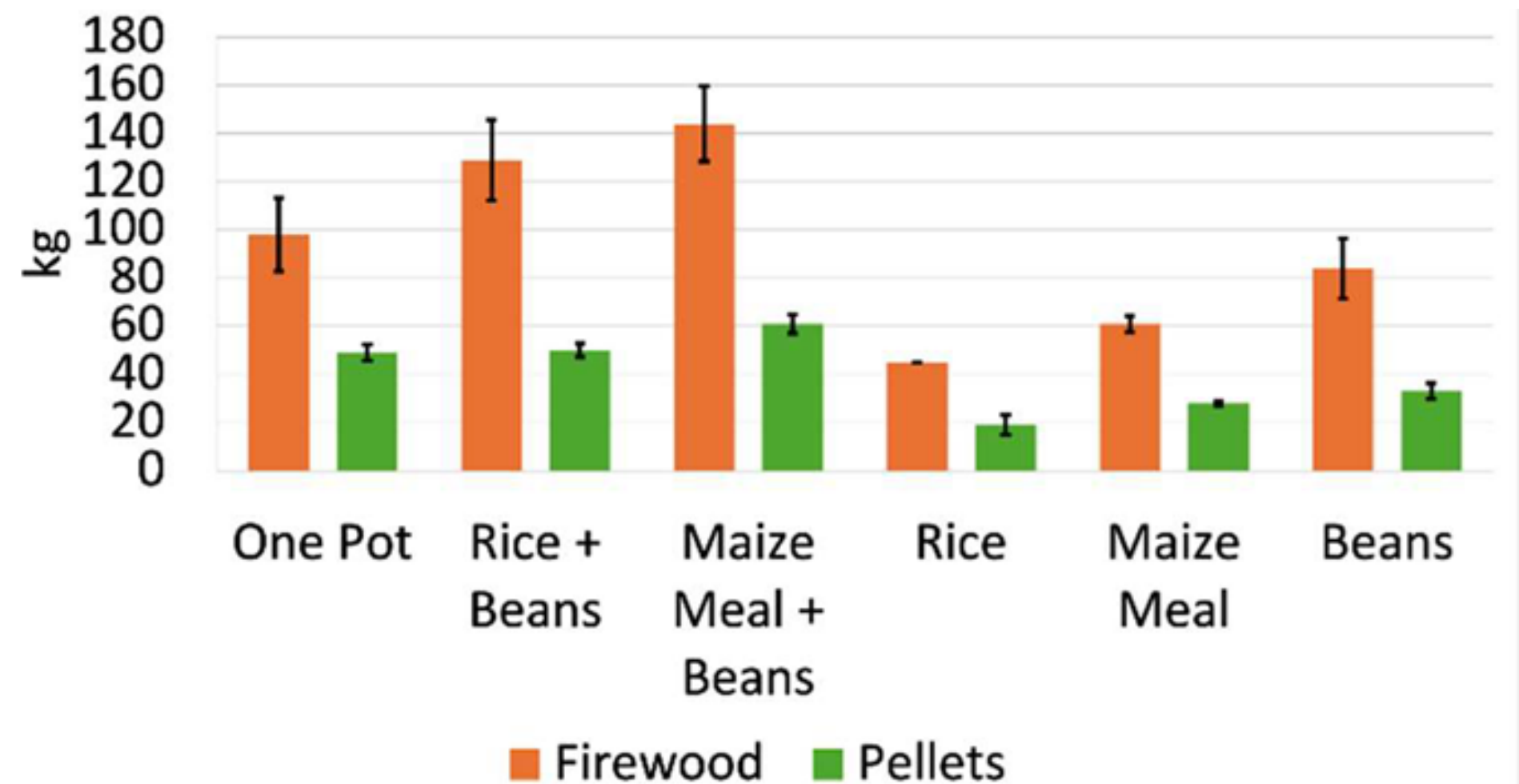
Reduced Wood Use

Achieved an **83%** reduction in firewood demand; this could improve to **92%** with a more efficient drying system for pellet production.

Pellets are made from waste wood, not firewood.

Pellets provide more consistent and controlled fuel use.

Amount of firewood and pellets needed per dish or staple



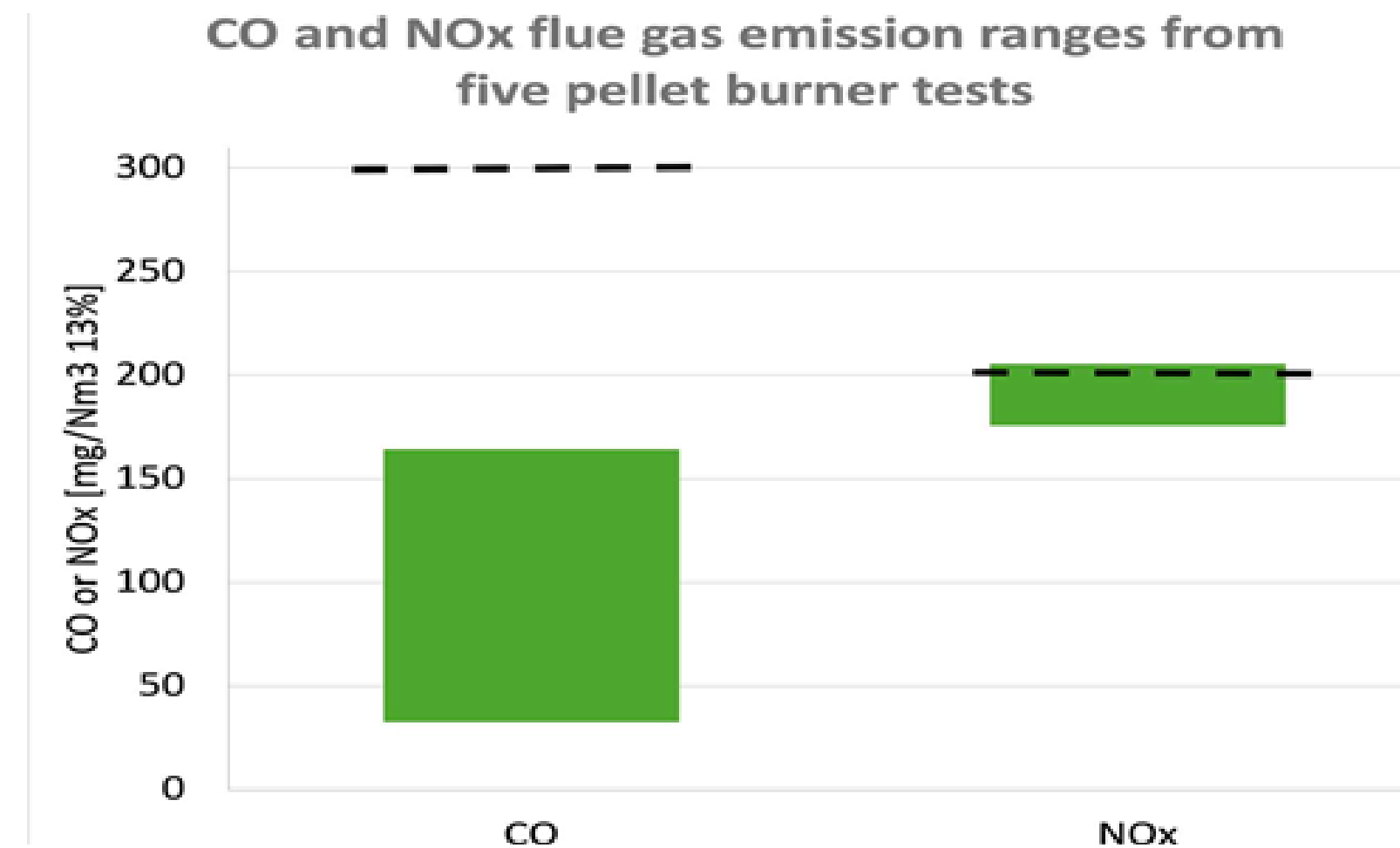
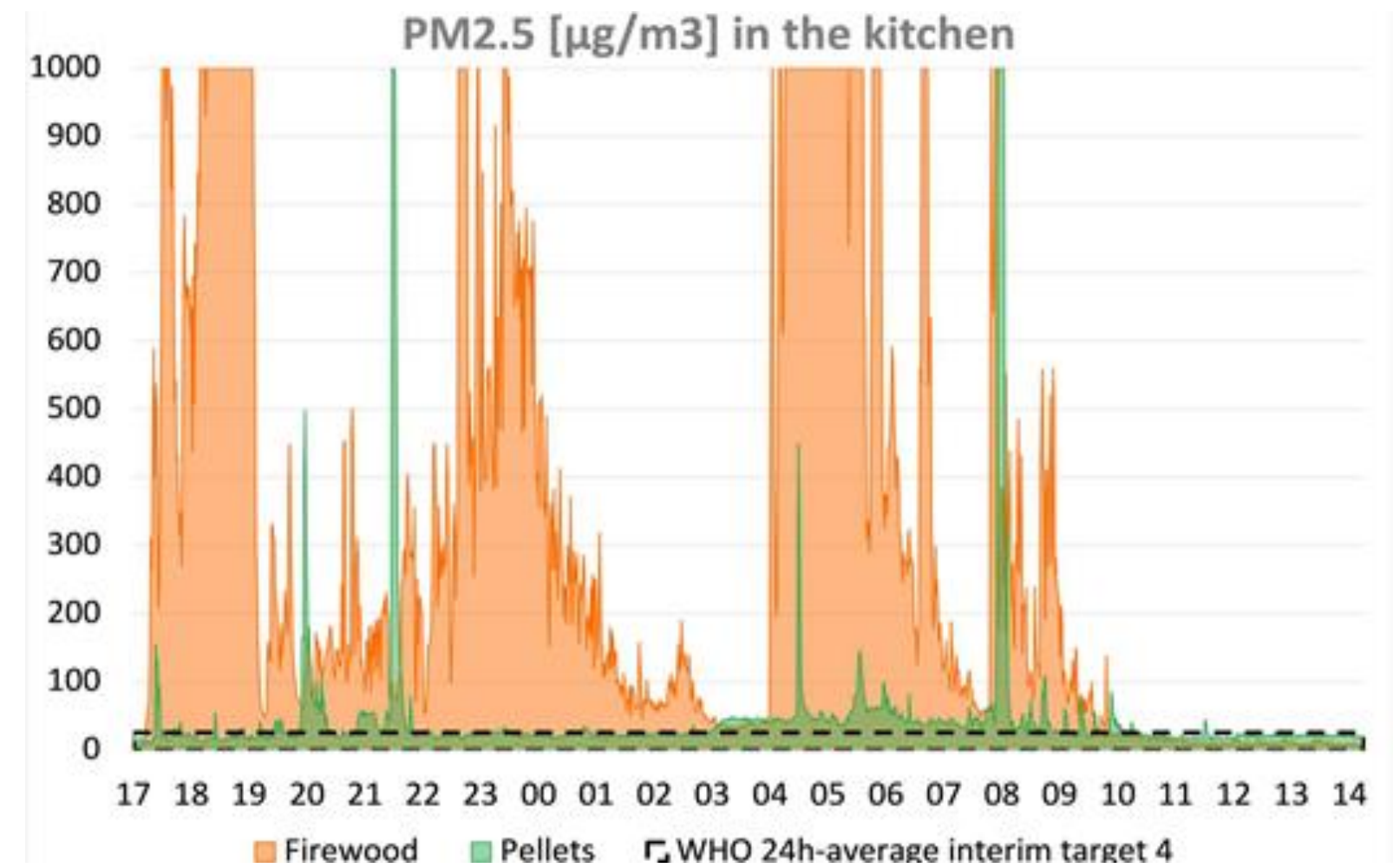
Smokeless Kitchen

The conversion to pellets **drastically reduced smoke** generation in the kitchen.

Pellet burners showed good combustion with no visible smoke from the chimney.

Particulate matter (PM2.5) reduced by a factor of 100, **meeting WHO targets**.

Flue gas emissions of CO and NOx were within EU regulation limits.

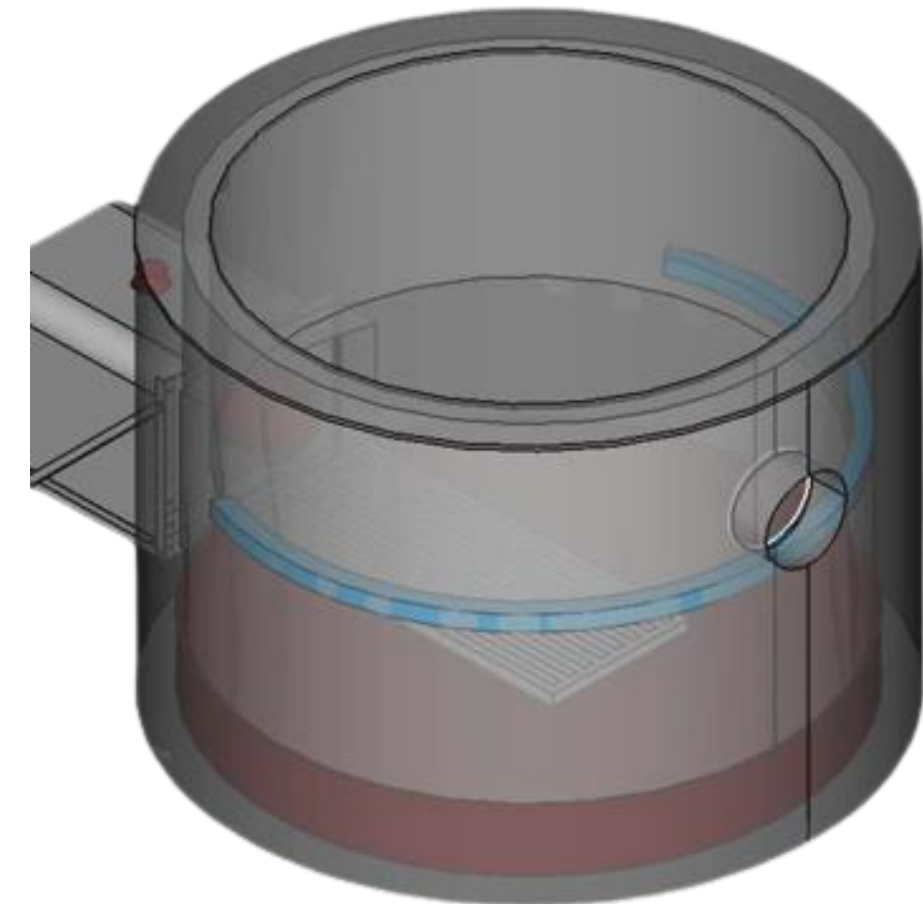


Low Investment Costs

At **€3,000 per pellet burner**, conversion costs are much lower than those for LPG and electric systems.

No need to change the cookstove - only the energy input is changed by adding the pellet burner.

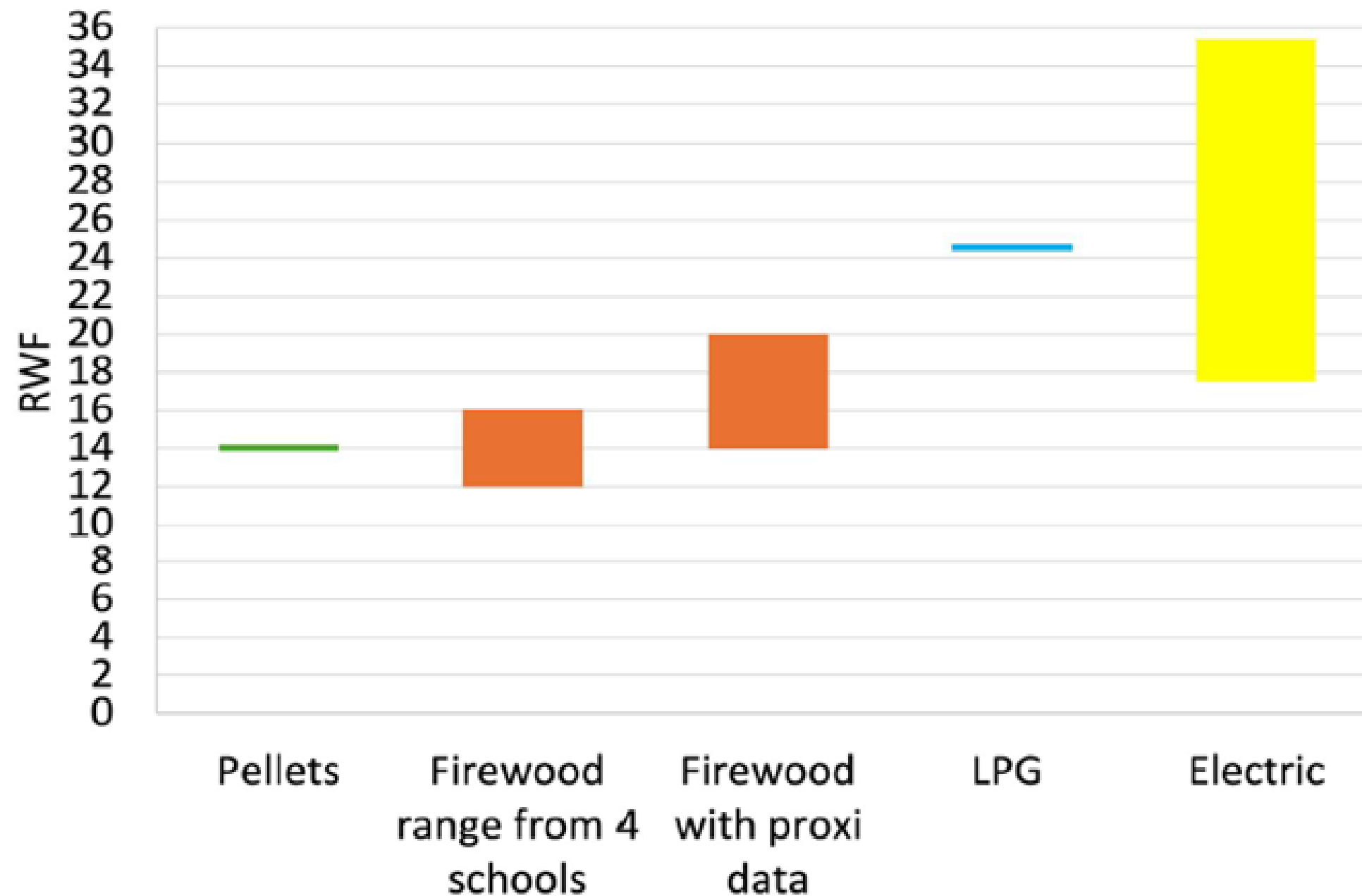
To ensure accurate cost comparisons, a larger pilot study is needed across multiple schools.



Modification of cookstove in blue - insulation

Low Running Costs

Cost per equivalent secondary student per day or meal



The initial pilot indicated that **daily fuel costs for pellets were comparable to those of firewood.**

Pellet cooking is expected to be significantly cheaper than LPG and electric cooking, depending on tariffs.

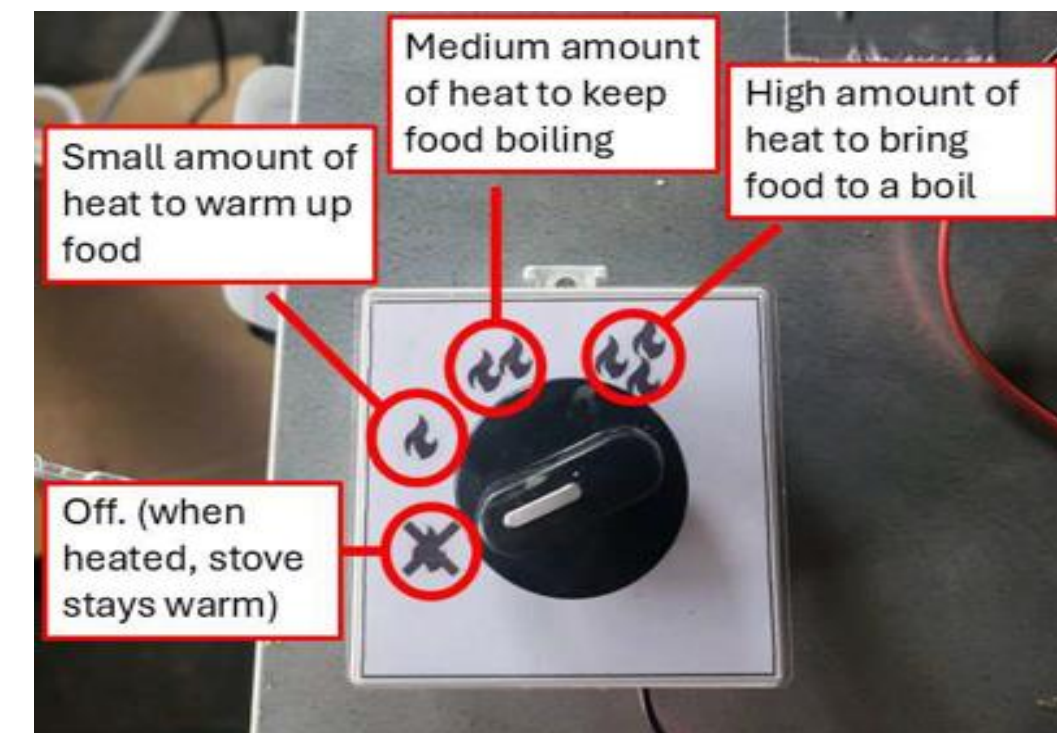
Increased Convenience



No issues with wet firewood during rainy season

No firewood cutting is needed; simply refill the pellet storage bin with a few bags of pellets once a week

With improved combustion technology, the pellet burner allows for precise power control, ensuring a reliable and consistent heat supply.



Control panel for consistent heat



Other Benefits

If the pellet burners fail, schools can quickly revert to firewood by simply removing the burner.

The system **doesn't require constant maintenance** like biogas.

Pellets are delivered on demand and can be stored for months in a dry space, taking up less room than firewood.

There is **no explosion risk**, making it safer than LPG.

Pellet cooking provides a solution that is

Clean

WHO 4+

CO2 emission reductions

Affordable

lowest cost

Renewable

wood residues, sustainable forestry,
energy crops

Domestic

employment (17,000 at risk)

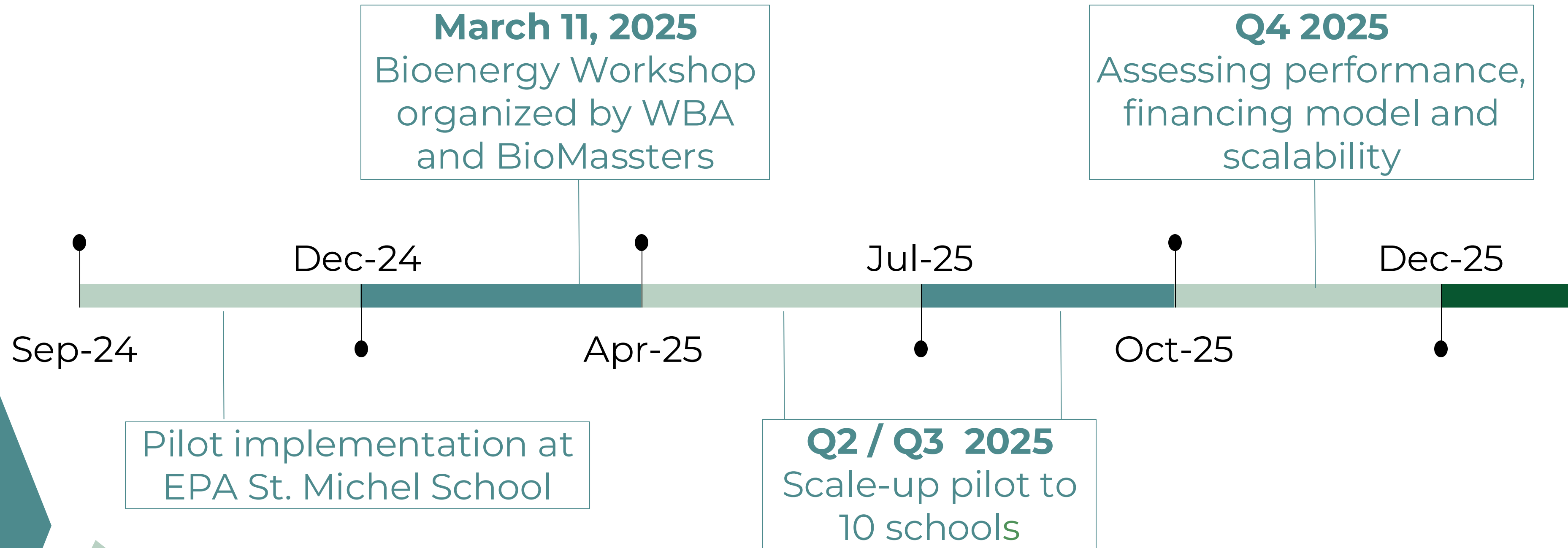
local pricing (low volatility, no subsidies)

no Foreign Exchange needed



Chef, How are you doing?
I am Doing Great

NEXT STEPS





THANK YOU FOR YOUR ATTENTION

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If you want to learn more about bioenergy and its use, visit our websites, email us or follow our social media presence.

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