

Modern Energy Cooking Services Programme

ATEC's Cook to Earn Phase 2

15-Sept-2023 to 31 Mar-2024

Final Report - March 2024

Background - Phase 1 to Phase 2 of C2E

Following a successful pilot & report in Phase 1 of Cook to Earn (C2E), ATEC proposed to investigate & test 3 further pathways in optimising eCook usage patterns through the use of carbon finance for further scale and international roll-out best practice. This was to be done across a minimum sample size of 200 customers. The testing areas included:

1. **Further test education and higher payment nudges** on existing C2E micropayment concept with a larger sample size. Includes further knowledge building and automated app integrations on savings, impact on electricity bill and time or usage-based app notification nudges to drive behaviour
2. **Tangible rewards** (e.g, pots, prize) rather than micropayments and see if this has a more significant impact on usage behaviour
3. **Test utilising C2E funding to offset hardware costs** rather than micropayments against electricity costs and if this is a more significant nudge on uptake and behaviour. This could be either through a reduction in upfront costs or offset ongoing against paygo payments.

Continuing the experimentation phase of the project as per above for a longer data collection period until March 2024 with a growing sample has provided a holistic validation of the concept to justify whether the ROI for larger investment, rollout and automation.

Phase 2 - Workstream Summary

Workstream 1 hypothesis: Nudging a larger group of people in a resource-lean, mobile app-supported way and with cooking cost covering/exceeding regular payments will lead to an increase in usage compared to pilot phase 1 base case:

- Validation: average usage increase > 25% vs Phase 1 base case and higher than control group
- Method: comparative analysis of NUDGE sample vs. control group and phase 1 average base case

Workstream 2 hypothesis: Incentivising people with a physical reward/prize rather than paying them can be done in a larger scale cost-effectively and increase usage:

- Validation: reward system pilot documentation; average usage increase > 25% vs Phase 1 base case and higher than control group
- Method: comparative analysis of REWARD sample vs. control group and phase 1 average base case

Workstream 3 hypothesis: Providing people with indirect, non-monetary, non-reward types of offsets against their upfront purchase price or against monthly paygo costs will increase usage:

- Validation: reward system pilot documentation; average usage increase > 25% vs Phase 1 base case and higher than control group
- Method: comparative analysis of OFFSET sample vs. control group and phase 1 average base case

By testing these 3 hypotheses ATEC can now share further **evidence-based research** on best practice for scale and be able to provide tailored solutions for cook-to-earn settings in future countries of activities, directly or through other partners in the global clean cooking community.

In summary utilising a lean multi-workstream, data-driven approach we have tested multiple options and developed a scalable approach that **improved eCook usage adoption by 55% per household** within the testing period. This has provided the evidence base to attract \$10M in project financing with Standard Chartered & IFC carbon-linked bond which will deploy a first phase 110,000 eCook in Bangladesh with carbon finance.

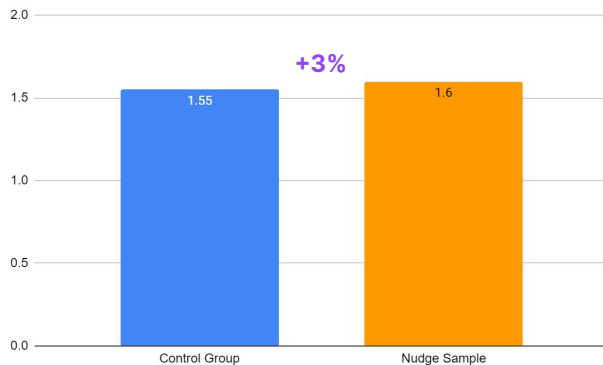
Recap: Initial High-level project rollout plan

PROJECT DELIVERABLES & TIMEFRAME	2023			2024		
	Oct	Nov	Dec	Jan	Feb	Mar
Customer Acquisitions						
Lead generations						
Acquisitions & onboarding						
Tech Infrastructure						
Usage data into HS						
Schedule Placeholder Message in SMS portal						
Whatsapp Message Automations						
Workstream 1: NUDGE						
Develop different NUDGING method (sms, direct call)						
Set up sample and test approaches, then observe/analyse usage						
Usage analysis						
Summarize and document Nudging best practice to change behaviour						
WORKSTREAM 2: REWARD & OFFSET						
Develop different REWARD method (pots, bonus point redemption)						
Set up sample and test approaches, then observe/analyse usage						
Usage analysis						
Summarize and document Nudging best practice to change behaviour						



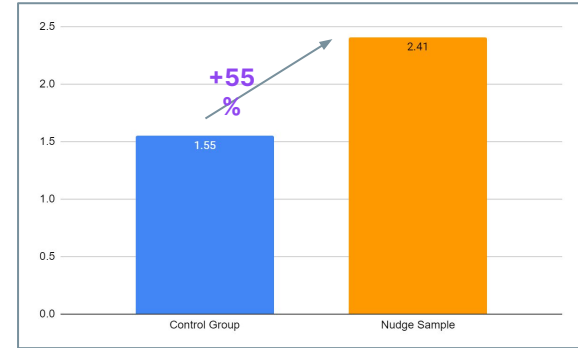
Workstream 1: Nudging

- Nudging, while well received, didn't lead to a significant increase in usage with a result of 3% increase vs control group in the same period (Dec'23 - Feb'24).
- Key activities included:
 - Various educational content was produced by in-house as well as users and social media influencers that advocated for how to increase usage and functionality on the eCook stove. This was well received and seen as informative, but didn't lead to significant behaviour change.
 - A shift from weekly micropayments to monthly payment structure was implemented to increase the perception of a larger \$\$ size payment received. Reception to this was muted.
- A new SMS-based notification provider was onboarded as a way to cost-effectively scale an increase customer interactions. This was used in nudging and overall is a viable tool for mass adoption, particularly for non-smartphone households. ATEC will continue to utilise this along with further app improvements.



Workstream 2 & 3: Offsets & Rewards

- Through internal discussions and customer interactions, it was decided to combine workstream's 2 & 3 into one package called **Cook-to-Own** (C2O).
- C2O used a carbon pre-finance approach to **offset (2)** the upfront cost of the stove down from \$100 to \$40 - a cash price point attainable for the majority of target households.
- But the communication to households was that it was \$40 upfront but still a \$100 product - they then 'pay-off' the \$60 over 3 years by using it as their 'primary cooking device', defined as **>2kwh per day**. In effect, a variation on a lease-to-own structure.
- If customers did not meet this 2kwh target, they would be liable to pay \$5 per month as an inverse incentive scheme.
- This was then combined with **rewards (3)** for achieving the 2kwh target minimum. Rewards included mobile money credit for hitting the target, then by hitting the target they would go in the draw to win a 'mega prize' of a new fridge for their household (seen as an aspirational item).
- This combination of Offset & Reward led to a **55% increase in usage** and a average daily usage of **2.41kwh**. This is by far the best results of all testing we've completed throughout the 2 phases of the C2E project.
- Further to these results, this also presents the most scalable solution to getting eCook into the hands of Base of Pyramid households where upfront cost is the most significant factor, combined with incentivisation to optimise usage per stove deployed



Summary & Next steps

- Phase 2 was a highly critical step for C2E as we knew we had the right idea but didn't think the mechanism was quite right
- Through utilising our live data, we were able to lean-test a variety of options quickly and see the next day the impacts on usage behaviour.
- Through this we were able to iterate quickly to the optimum result - Offsetting the upfront cost of the stove under a lease-to-own structure, then combining this with Rewards to drive usage uptake
- The results here resolves one of the current largest issues in the cookstove sector highlighted by the [UC Berkeley report](#) - that distributing a stove is not enough to ensure usage adoption and 100% data-verifiable carbon credits.
- We have shown that this is indeed possible - that we can meet and exceed the 2kwh/day threshold by 20% to where a carbon project becomes viable
- With this data, ATEC has been able to pitch this to various project finance stakeholders such as Standard Chartered Bank & International Finance Corporation (IFC, World Bank).
- Validating the C2O model has led to us developing with Standard Chartered a \$60M blended-finance carbon bond instrument which will derisk carbon finance in LDCs for major investors. This will finance 110,000 cookstoves with credits to be bought by Engie
- While this carbon bond is still in negotiation, this coming through would mean the £120,000 grant has catalysed \$60M in private sector investment, a catalytic multiple of 500x
- Further to this, this initial \$60M bond structure is seen as a proof of concept by SC & IFC, with the plan to expand this across multiple markets and buyers in Asia & Africa.
- This is all only possible given MECS support in ATEC pushing the frontiers of what is possible in eCook tech and carbon markets. We thank MECS for their ongoing support

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Sizing the Carbon Linked Bond Notional

5Y Bond Tenor			
Project cost	10,000,000		
Bond Tenor	5 Years		
Issuer Funding Cost	4.25% (7y US Trpy + 150bp)		
Bond Coupon	5.25% (7y US Trpy + 1100bp)		
Issuer Fixed Cash Coupon rate	0.50%		
VCU Linked Coupon rate	4.80% (7y US Trpy + 650bp)		
Bond Notional (\$)	58,976,853		
Total VCU Linked Coupon (\$)	14,287,684		
VCU sale price (\$)	12	13	14
AVCLUs required	1,195,666	1,099,876	1,020,271

7Y Bond Tenor			
Project cost	10,000,000		
Bond Tenor	7 Years		
Issuer Funding Cost	4.40% (7y US Trpy + 200bp)		
Bond Coupon	5.40% (7y US Trpy + 1200bp)		
Issuer Fixed Cash Coupon rate	0.50%		
VCU Linked Coupon rate	4.90% (7y US Trpy + 700bp)		
Bond Notional (\$)	43,264,596		
Total VCU Linked Coupon (\$)	14,870,454		
VCU sale price (\$)	12	13	14
AVCLUs required	1,239,205	1,143,881	1,062,175

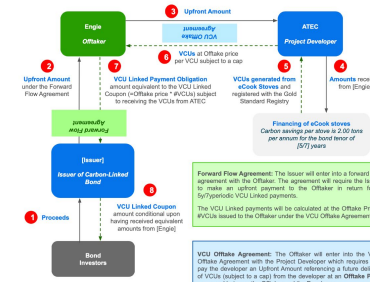
2 The Notional does not include fees

- We have assumed that the Issuer in this case is an MDB/Sovereignal entity funded at LIB+Theatry +150bps for a 5y and +200bps for a 7y bond
- The Carbon Linked Bond Coupon is priced at 1% premium over the funding cost of the Issuer for a similar tenor. The premium is allocated for the structural nuances of a variable coupon and the liquidity of the bond given the Notional size
- The Bond Structure assumes that the Issuer will pay a minimum cash coupon of 0.50bp p.a. to the investor. The balance, i.e. the VCU Linked Coupon, is paid via monetisation of the VCLUs issued at an agreed price by the Offtaker
- The Notional of the Bond is sized by equating the Present Value of the Issuer coupon payments at the Issuer funding cost with the Upfront Project Cost (USD10m)
- The notional for a 5y bond is USD58.9m and a 7y bond ~USD43.3m. The 7y bond has a lower notional since it allows a longer time period for the payback of the project cost
- Once the total VCU Linked Coupon of up to USD14.3m/14.8m has been paid, there is no further transfer of carbon credits required from ATEC to the Offtaker
- Based on the Offtake price range (between USD12-14), the Number of VCLUs needed through the life of the bond will be 1.02-1.18m for a 5y bond and 1.06-1.24m for a 7y bond



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Proposed Carbon-Linked Bond Structure



1 Issuer will only be a Multilateral Development Bank representative entity, subject to regulations, SOE might assume the role of the issuer as an alternative

- Issuer places a \$28.9433m Carbon-Linked Bond on private placement basis for a 5y/7y fixed maturity
- Engie, the VCU Offtaker, will enter into a Forward Flow Agreement with the Issuer under which the Issuer will make an Upfront Payment to the Offtaker for \$10m from the issue proceeds in consideration for being paid the VCU Linked payments based on the notional value of the VCLUs as determined per the VCU Offtake Agreement between the Offtaker and the Project Developer
- Engie will enter into a 5y/7y VCU Offtake Agreement with ATEC. Under the agreement, Engie will pay the Upfront Amount of \$10m to ATEC in consideration for being delivered the VCLUs issued from the project (subject to a call) based on an agreed Offtake Price per VCU. The Offtake Price represents the price per VCU at which Engie agrees to purchase the VCLUs by 7y period. ATEC will ensure such VCLUs are transacted into Engie's account regulated with the Gold Standard Registry
- ATEC will finance deployment of 110,000 eCook stoves with the Upfront Amount received from Engie
- VCLUs will be issued from the eCook stoves. ATEC shall ensure that all VCLUs subject to the VCU Offtake Agreement are registered with the Gold Standard Registry
- Engie is obliged to pay Issuer the VCU Linked payment amount equivalent to the VCU Linked Coupon subject to receiving the VCLUs from ATEC as stated under the VCU Offtake Agreement
- Issuer will pay bond investors the VCU Linked Coupon conditional upon receiving equivalent amounts from Engie



Project Budget



Cook-to-earn phase 2	Budget £	Actual	Comments
Project Management	£19,500	£19,500	On budget
Engineering	£28,080	£28,080	On budget
Market testing - advertising & related costs	£3,900	£7,040	Above budget, but offset against travel
Reward systems and incentives	£12,090	£22,090	Increased with C2O offset expenses under new setup, offset again App & travel costs
App notification testing	£19,500	£9,500	Given initial findings, further budget was allocated to incentives (offset)
Systems & data integration	£7,800	£7,800	on budget
Financial & data analysis	£9,263	£9,263	on budget
Travel	£6,240	£3,100	Reduced, offset against market testing
Customer report development	£2,718	£2,718	on budget
Project Overheads (10%)	£10,909	£10,909	on budget
Total	£120,000	£120,000	

Thank you

