

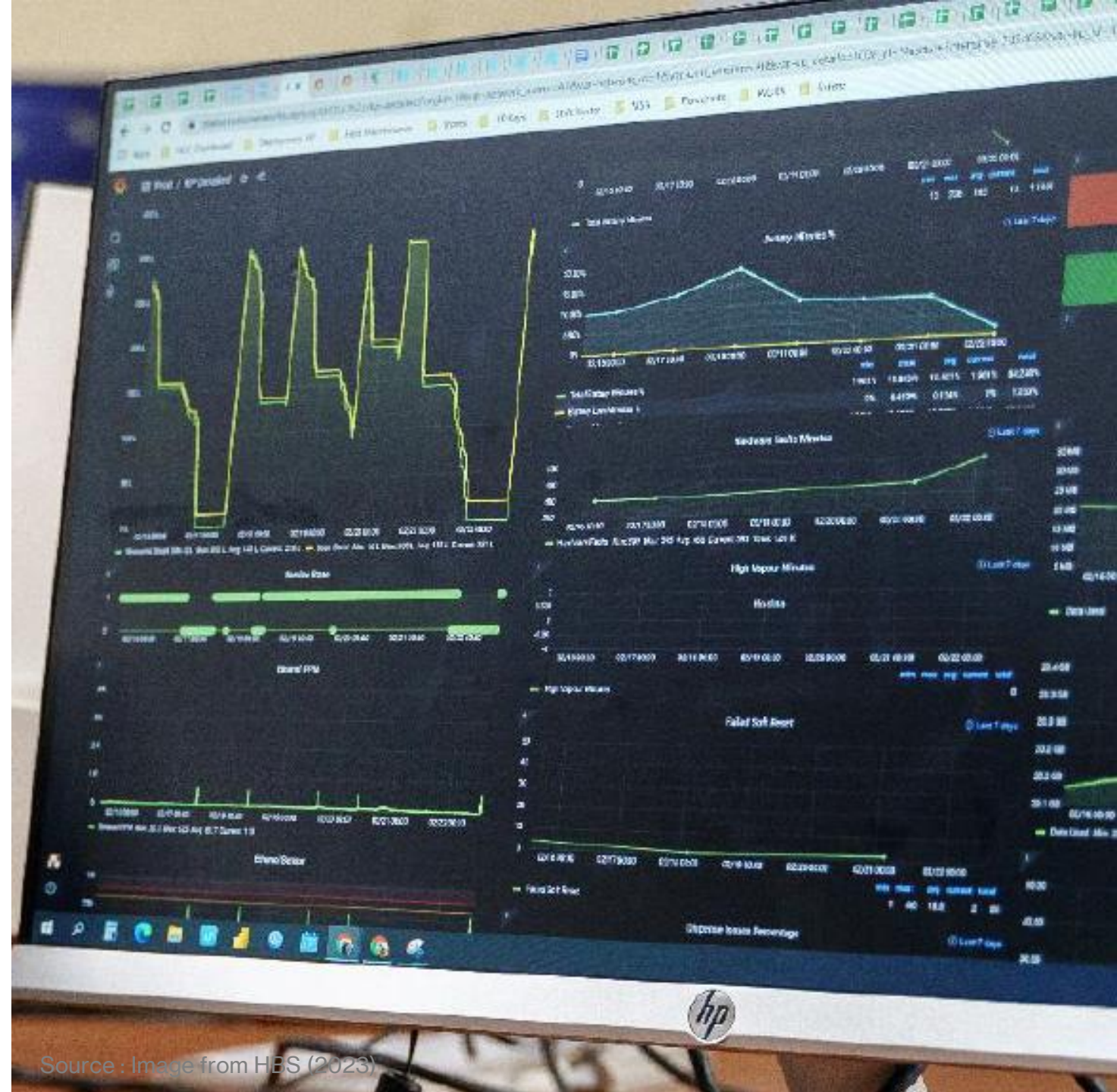
Innovating and Scaling Ethanol Clean Cooking: Technology, Supply Chain, Safety & Deployment

Mr. Sagun Saxena

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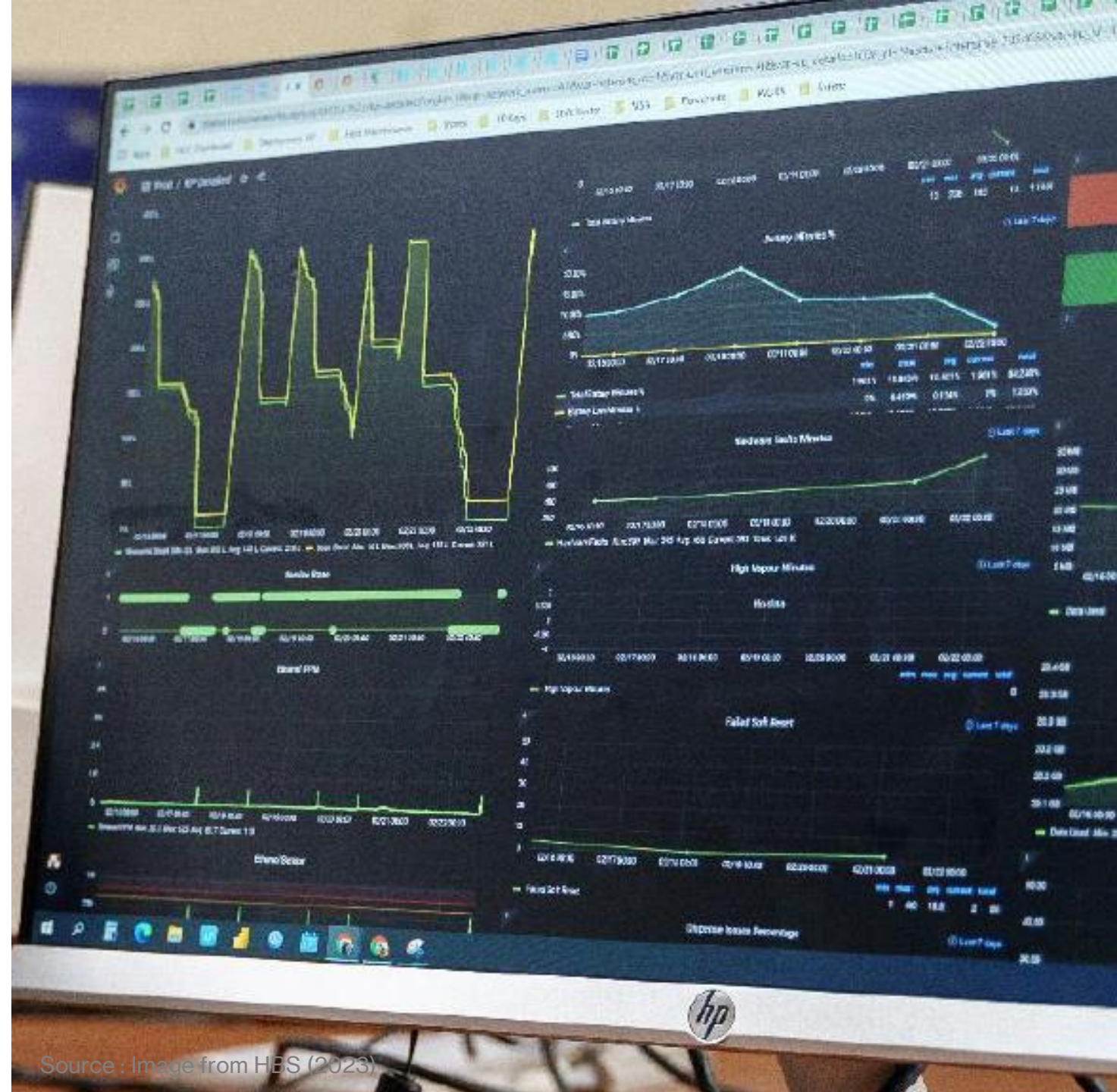
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Innovating and Scaling Ethanol Clean Cooking: Technology, Supply Chain, Safety & Deployment

Agenda

- What Do We Mean by Scale?
- The Evolution of Ethanol Cooking
- Critical Success Factors
- Opportunity for India
- To Learn More



What Do We Mean by “Scale”?

- ☑ **Solution adopted by major Consumer segments**
- ☑ **Proven, functional stoves & reliable fuel supply**
- ☑ **Contributes significantly to overall energy mix**
- ☑ **Affordability & performance improve with implementation** (move beyond ‘pilot’ stage)

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TYPICAL TRANSITION PATHWAYS FOR COOKING AT SCALE



Large-scale cooking energy transitions have always been driven by the combination of **new technologies + new business models + sustained government support**
Recent scaling in ethanol & biogas driven by increased political will & climate finance.

Ethanol Cooking Has Evolved For Scale

Origin

WWII => 1970s

- On-farm use
- Camping/boating

Approach

- Basic stoves
- No regular local fuel supply (self-made)



Geography & Scale

- Niche in NA/EU

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Version 1.0

2010-2020+

- Mostly aid/govt-funded pilot programs
- Some commercial/carbon ventures

Approach

- De-costed camping stoves
- New ethanol fuel storage & bottling plants
- Single-use PET/HDPE bottles distributed like FMCG and sold by resellers
- Often paper-based, cash-heavy model



Geography & Scale [Areas w/o LPG subsidies]

- Moz (~ 35k), Kenya (~20k), Tanz (~50k?), ...

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Geography & Scale [Areas w/o LPG subsidies]

- Moz (~ 35k), Kenya (~20k), Tanz (~50k?), ...

Version 2.0

2020-2025+

- Commercial/carbon venture

Approach

- Purpose-designed ethanol stove
- Bulk fuel movement using existing infra
- Smart ethanol dispensers placed in shops safely refill canisters on prepaid basis
- Data-rich, cashless model
- Carbon finance replaces govt subsidy



Geography & Scale

- Kenya & Rwanda (~1,300k households)

Five Critical Success Factors for Deployment

Product Performance

Modern cooking experience:

- Clean blue flame like LPG
- Precise firepower control
- Fits existing cooking habits

Safety:

- Vapor-tight refilling chain
- Sturdy stove fit for daily use
- Ethanol-compatible materials
- Equipment safely serviceable
- IoT sensors to track fuel flow and theft/diversion attempts

Five Critical Success Factors for Deployment

Performance

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Pricing

Attractive upfront stove price :

- Comparable to other options
- Likely below cost

Set comparable fuel price:

- Requires very low distribution costs (cut capex, margins, inefficiencies)
- Digitally-targeted rations/subsidies

Minimize fuel purchase bundle size:

- Aligned with purchasing power
- Usually under \$1 (vs. \$7 for LPG)

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Proximity

Reputable stove supplier

- Credible, trained local shop/agent to create awareness & complete sale

Convenient fuel supply

- Walking distance of target home
- Always available: assured quality, at official price, no stock outs (requires using existing fuel distribution infra)

Direct 1:1 customer support

- Advice from shop + contact centre
- Warranty policy + promotions

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Policy Support

- | | | |
|---|---|---|
| - Comprehensive stove, fuel & distribution technology standards aligned with global practices | - Level playing field with other fuels | - Encouraging partnerships with incumbent fuel companies for infra |
| - Strict safety enforcement | - Sustained support that values many benefits of ethanol cooking | - Supporting small shops to participate in last mile fuel supply & user support |
| - Innovation sandboxes | - Facilitate regional/state or international/climate co-financing | |

Five Critical Success Factors for Deployment

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- Standard hardware & software interfaces for safe & efficient flow of fuel, money & data between partners & regulator/govt.

Platform

The Opportunity for India

Universalize clean cooking
with surplus bioethanol
using home-made technology



- ❌ **LPG importation and distribution has always been costly for India**
Huge forex burden + many direct & indirect costs borne by government
- ❌ **LPG supply is highly susceptible to geo-political tensions**
Volatile supply & FX rates; import dependence not aligned with country's vision
- ❌ **Many consumer segments still don't use LPG regularly**
Challenged by LPG refill access and/or full-cylinder affordability
- ❌ **LPG and grid electricity are cleaner than biomass, but still fossil-fuel dominated**
Use releases greenhouse gases which are counter to India's net-zero goals
- ✅ **Meanwhile, local Ethanol is abundant and highly renewable**
Indian distillers are producing at only ~50% of their capacity
- ✅ **Ethanol cooking can leverage existing fuel infrastructure (until the last-mile)**
Indian OMCs have nationwide liquid fuel storage & distribution capabilities
- ✅ **For the last mile, innovative solutions have now been proven at scale**
Purpose-designed Ethanol cookstoves, smart dispensers and refillable canisters made in India and with 5+ years international operating record now available

Key Takeaways

- ➔ **Ethanol cooking solutions have evolved for scale**
(it is not just about cookstoves)
- ➔ **5 critical factors for successful deployment**
(performance, pricing, proximity, policy, platform)
- ➔ **India has a unique opportunity to harness at scale**
(time to signal political will & enable implementation)

Learn More:

International Energy Agency (2023), [A Vision for Clean Cooking Access for All](#)

Dalberg (2018), [Scaling up clean cooking in urban Kenya with LPG & Bio-ethanol](#)

Harvard Business School (2023), [KOKO Networks: Bridging Energy Transition and Affordability with Carbon Financing](#)

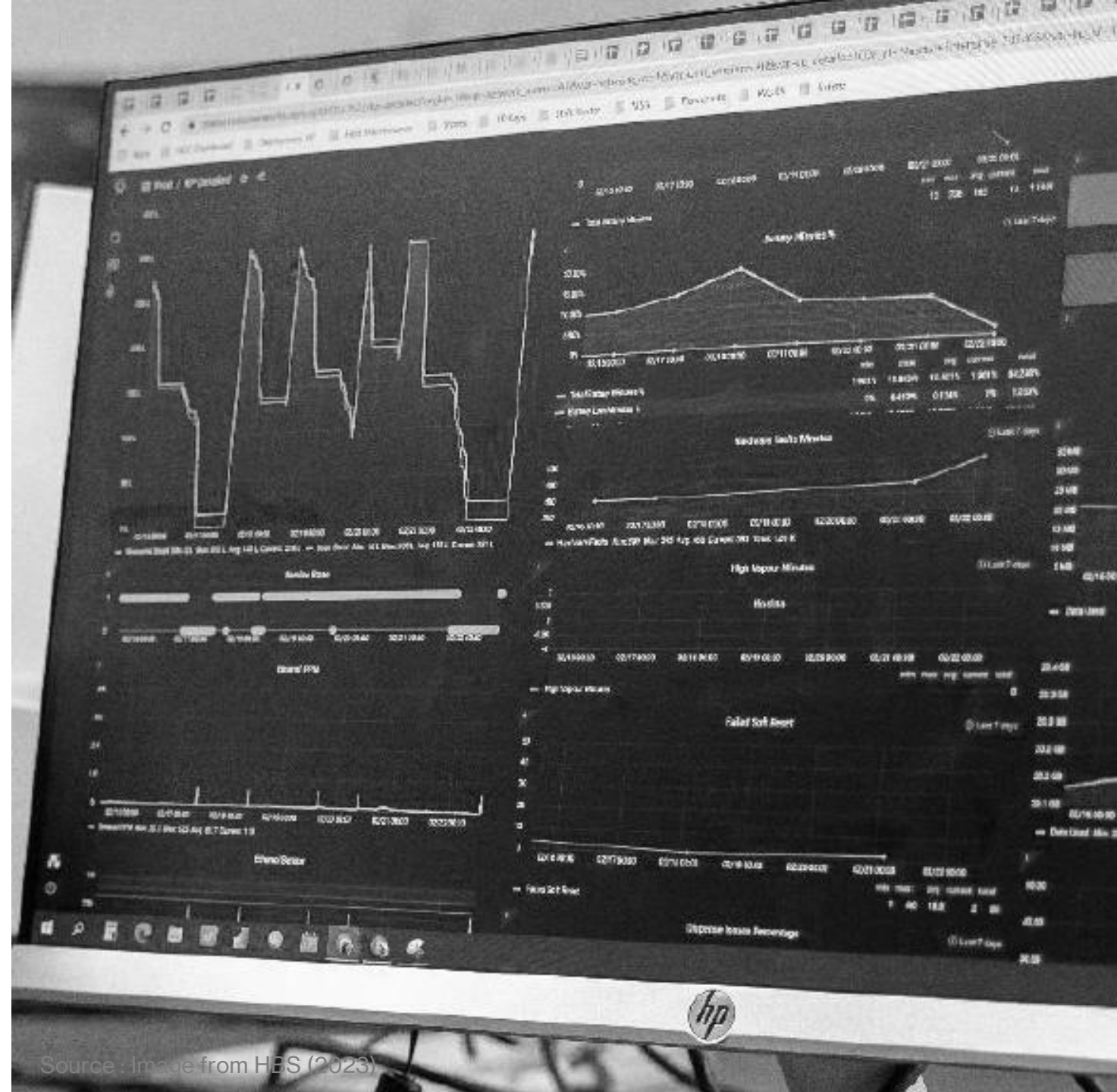
KOKO (2026), [KOKO Manufacturing Website](#)

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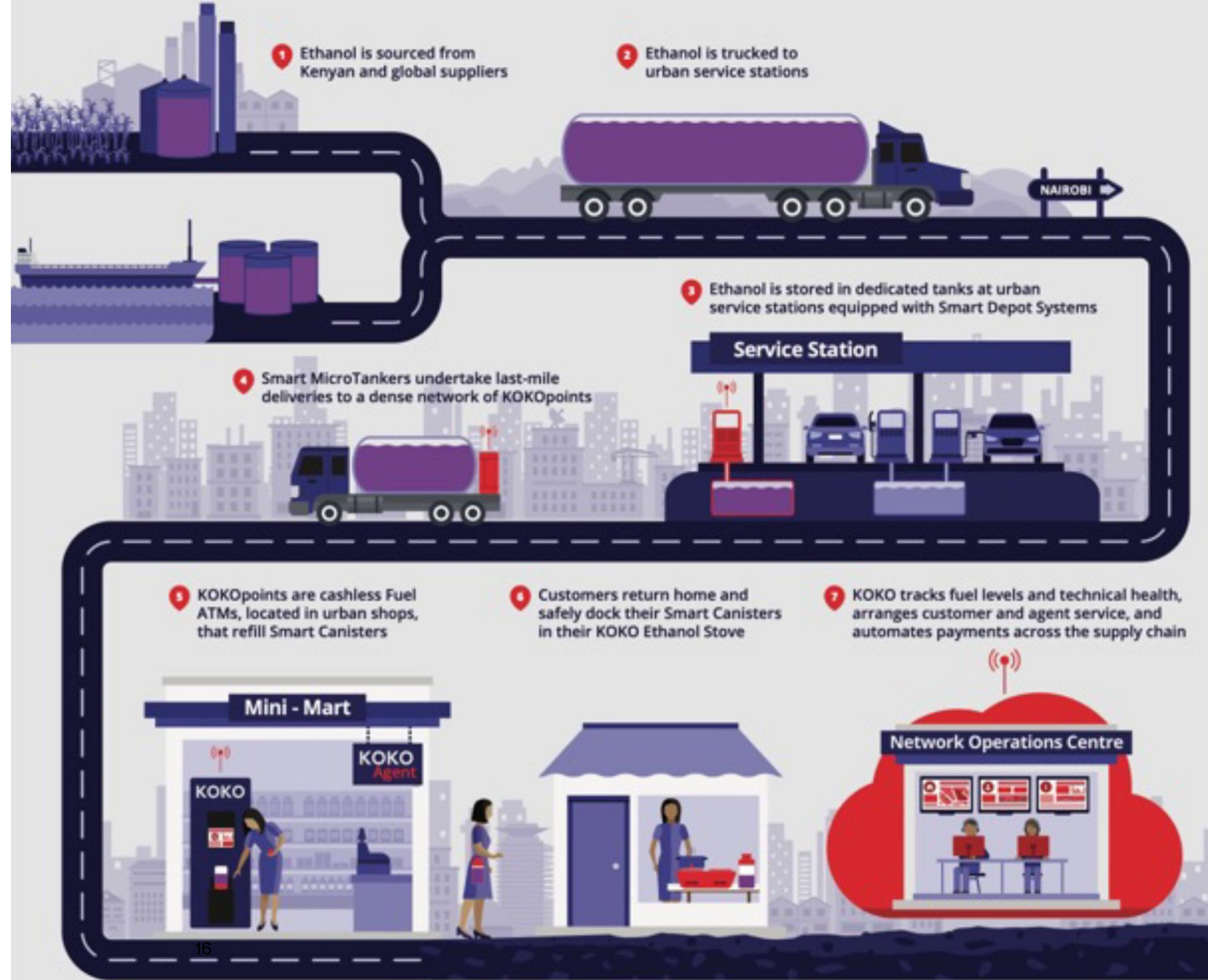
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Appendix 1 :

KOKO FUEL SUPPLY CHAIN



Appendix 2 :

KOKO ETHANOL STOVE & REUSABLE CANISTER



Appendix 3 :

KOKO SMART FUEL DISPENSER



KOKO Points are automated fuel dispensers that enhance the proximity, speed, safety and efficiency of retailing bioethanol cooking fuel directly to consumers.

Prior to visiting a KOKO Point, consumers top up their KOKO wallets by using mobile money services like M-PESA or by handing over cash to the shopkeeper.

Consumers then dock their registered KOKO canister in a vapor-tight way with the dispenser, and select the exact amount of fuel to dispense based on their KOKO wallet balance.

The dispensers hold up to 300L of fuel and incorporate backup power and internet connectivity to enable 24/7 remote monitoring of fuel level and safety sensors.

