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Low Energy Inclusive Appliances (LEIA): Using end-user insights to develop standardised impact metrics for the sector

Gill Davies and Richa Goyal, Energy Saving Trust

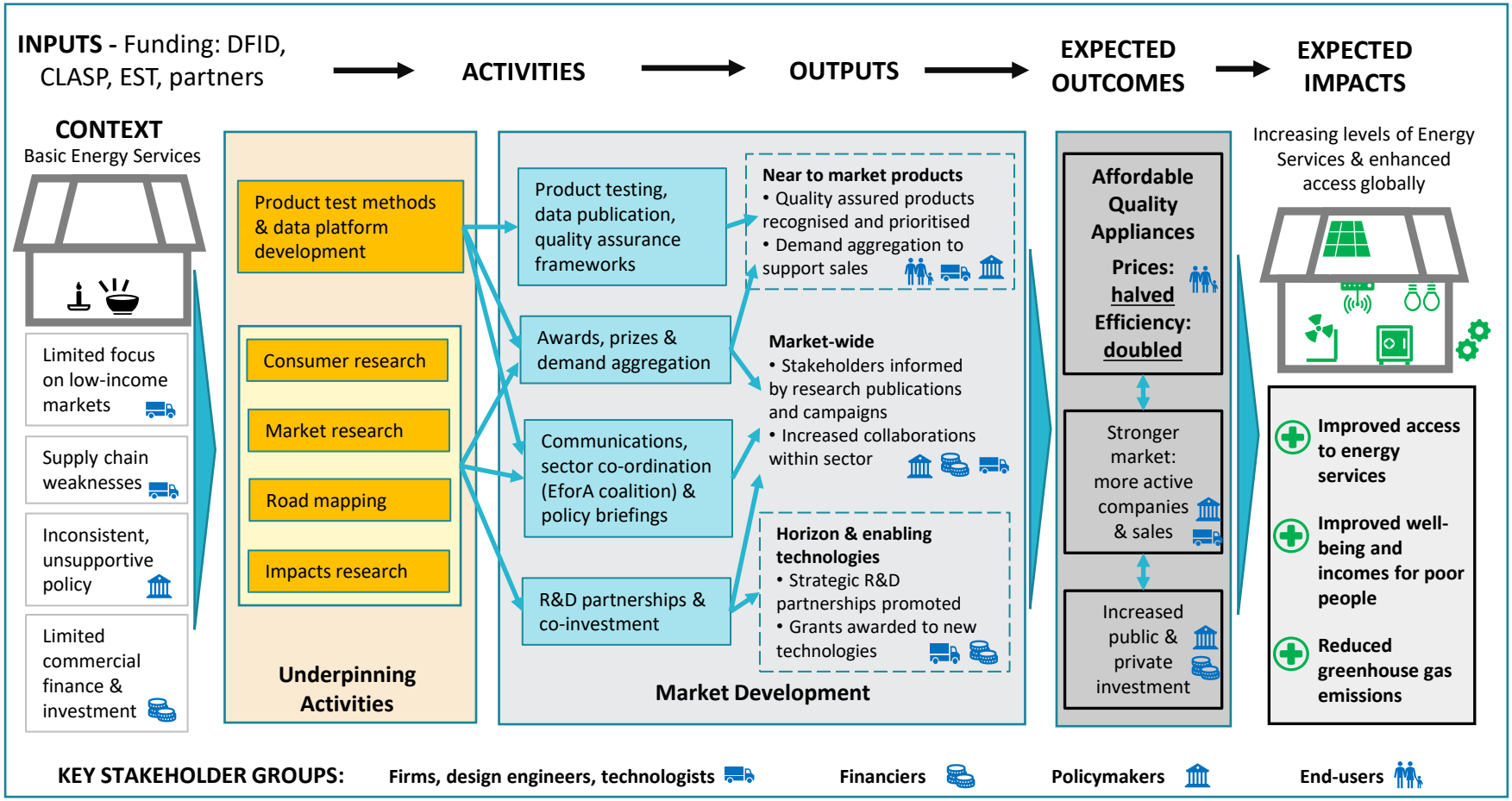
Low Energy Inclusive Appliances (LEIA)

- 5 year (2018-2022) £22m project funded by FCDO and IKEA Foundation, co-managed by EST and CLASP.

- Aims to accelerate the **availability, affordability, efficiency and performance** of appliances suited to off and weak-grid contexts in Africa and South Asia.

- Diverse activities to support **innovation and market growth**, to help deliver **end-user impacts** from appliances.

LEIA Theory of Change



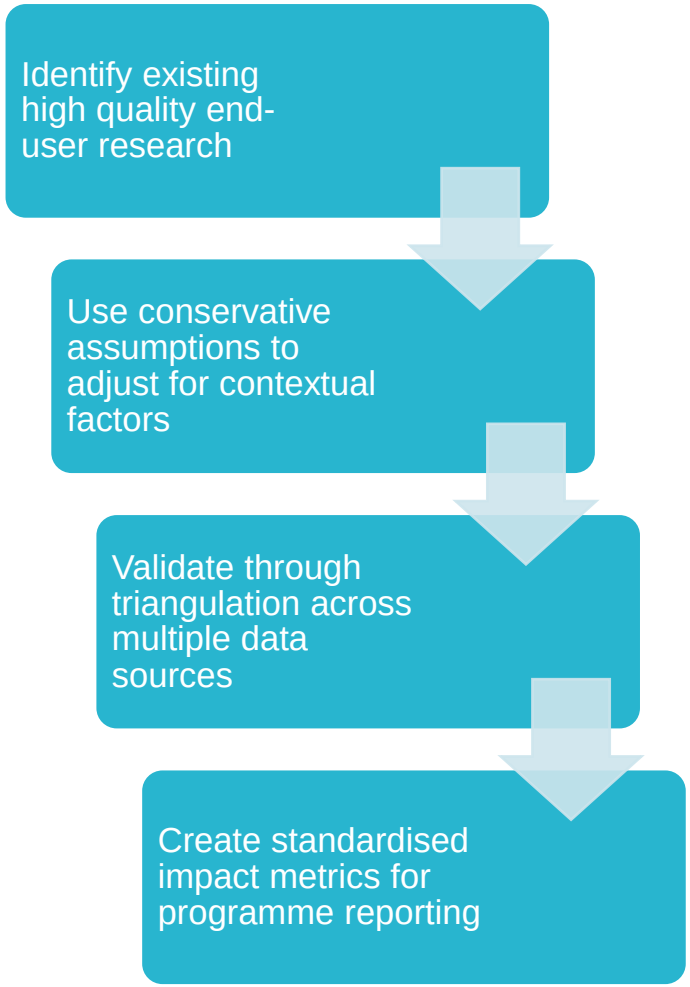
LEIA Programme Impact Tracking

- Tracking of sales and impacts delivered for fans, TVs, solar water pumps (SWPs) and refrigerators.

Intended impacts	Tracking methods
1. Energy access: number of people benefitting from LEIA appliances	• GOGLA bi-annual sales surveys • Existing published research → **impact metrics**
2. Income and livelihoods: Measured by: a) household savings due to LEIA appliances b) (i) time savings b) (ii) increased productive time c) income generation from productive use	
3. Environmental impact: GHGs avoided	

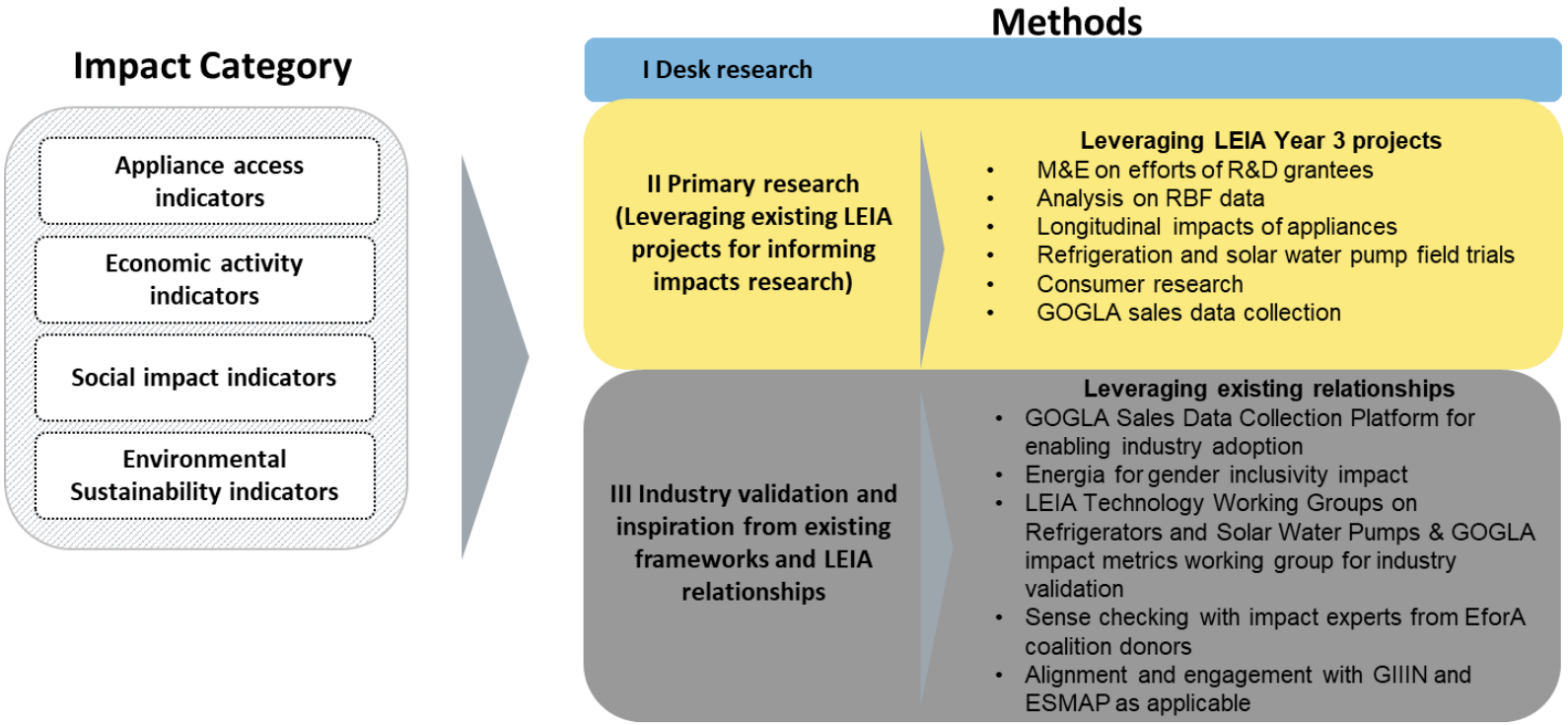
Standardised Impact Metrics

- Preliminary **impact metrics** developed for programme tracking using existing research.
- Realised **other sector stakeholders** can also benefit.
- Companies in receipt of R&D grants and broader stakeholders asking for help in this area
- EforA donor coalition and investor network members



LEIA Impact Assessment Framework

- There is a need for a shared impact measurement framework: Other sector stakeholders also need to **understand and communicate impacts** from appliance usage. Such a framework can help standardize impact reporting and help inform **investment decisions and donor interventions**.
- LEIA's impact assessment framework links with the LEIA Theory of Change.
- It seeks alignment with other impact frameworks such as the GIIN and is being done in collaboration with GOGLA, Rural Senses and SVT



First Published Impact Metrics

LEIA programme impact metrics and GOGLA SHS metrics

Additional data collection and expert peer review with Impact WG

Agree and publish standardised impact metrics

Fans and TVs: Metric Examples

Impact Metrics – Overview of Formulas

2. Economic Activity

2a	Number of People using their appliances to support enterprise	Fan TV	$S_L \times (1 - D_L) \times E$
2b	Number of People generating additional income	TV only	$S_L \times (1 - D_L) \times IG$

Variables (input by user)

S_L	Number of units sold which are estimated to currently be in use (based on the products estimated lifespan being [1.5 x warranty] period)

Variables (standard value)		Fan	TV
D_L	Discount for loss: products not working or not in use, excluding loss in supply chain	3%	7%
E	The percentage of customers using products to support enterprise (including those that have opened a new business)	3%	9%
IG	Percentage of customers/households creating additional income	-	4%

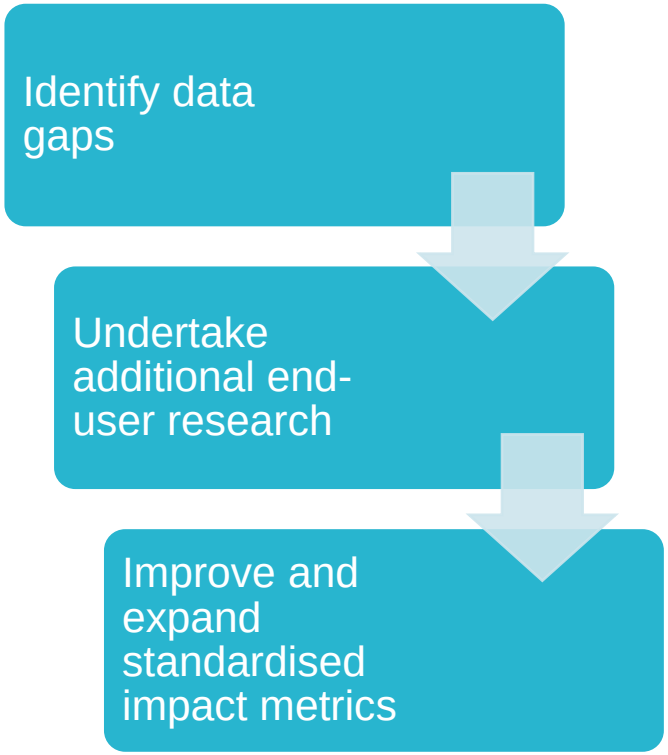
Pumps and Fridges: Metric Examples

- Pumps
  - Water conservation/ground water depletion – links with consumer awareness efforts
  - Increase in leisure time
  - Metrics like improvement in sanitation/hygiene practices where research can help inform if improved availability in water access has led to improvement in sanitation and hygiene practices

- Fridges
  - Increase in income – use of fridge for productive vs domestic use
  - Reduction in food waste/ food spoilage
  - Fridge utilization and its impact on energy consumption and fridge performance
  - Increase in comfort
  - Time savings

Identifying and Filling Data Gaps

- Identified data gaps in existing published research
- LEIA programme can undertake dedicated research into appliance usage patterns
- Generate more behavioural insights and impact data
- Refrigeration, solar water pump and milking machine field trials in progress



Refrigeration Field Trials

- Fridge user behaviour:
  - Stocking behaviour analysis
  - Domestic needs for fridge
  - Gender differences in stocking needs
  - Opening behaviour – this is also covered above
  - Change in stocking patterns through the year
  - Capacity adequacy, free space or over stocking
- Grouping users based on following consumption types:
  - Average Fridge energy consumption by food type loaded
  - Average Fridge energy consumption by business type
  - Average Fridge energy consumption by business hours
  - Possible energy consumption vs level of fridge loading
- This helps map user behaviour to observed energy consumption and fridge performance data

Summary and Conclusions

- Impact assessment will continue to be an iterative exercise as more data becomes available:
  - to add new metrics
  - cover more appliances
  - improve discount rates
  - potential regional disaggregation of metrics
- Linkages to broader sets of standardised impact investment tools: GIIN / IRIS +
- Strategic importance of estimating impacts in order to attract investment and inform investment decisions
- Specific requests for further metrics and positive feedback on first set from sector stakeholders

Thank you!