



Uganda Off-Grid Energy Market Accelerator

Reaching unserved populations

Framework for segmentation and strategy planning

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Market Accelerator seeks to reduce barriers to scale to accelerate off-grid energy access in Uganda

Today, about 80% of Ugandans live without access to modern energy. Bringing energy to these households has become a central focus of Uganda's development agenda, with frequent discussion on reaching 'universal access' in the coming decades.

The Uganda Off Grid Energy Market Accelerator (UOMA) is a dedicated and neutral intermediary, focused on scaling off-grid energy access in Uganda

We do this by reducing market barriers to scale and accelerating the path to universal access in Uganda through:

- **Research & Insights:** providing data, analysis, and insights to businesses, investors, development partners, and policy-makers
- **Coordination:** coordinating industry actors and resources to increase efficiency; and
- **Direct Interventions:** catalyzing interventions where necessary to reduce barriers to off-grid energy access.

UOMA was founded in 2017, borne out of a partnership between the Shell Foundation, DFID and Power Africa under their Scaling Off-Grid Energy: Grand Challenge for Development (SOGED) partnership. UOMA is managed by a team of technical experts with experience across many areas of off-grid energy, finance, business, policy & regulation, and development economics.

Based on market feedback, one of core accelerator initiatives is to analyze unserved populations and determine strategies to reach

The market accelerator is working on 5 high impact initiatives:

Expanding access to finance

Increase access to local currency debt finance for solar operators, bridging a critical working capital shortfall and currency mismatch and enabling operators to increase affordability of units

Reaching unserved populations

Reduce barriers to better target unserved populations in Uganda, improving access for some of the hardest to reach and most in need communities

Expanding productive use technology

Support industry to test and validate productive use technologies that can achieve economic benefits for off-grid Ugandans while growing energy demand

Strengthening government policy & targets

Support public sector to create effective policies and an effective enabling environment to increase off-grid energy uptake in Uganda

Facilitating communication & coordination

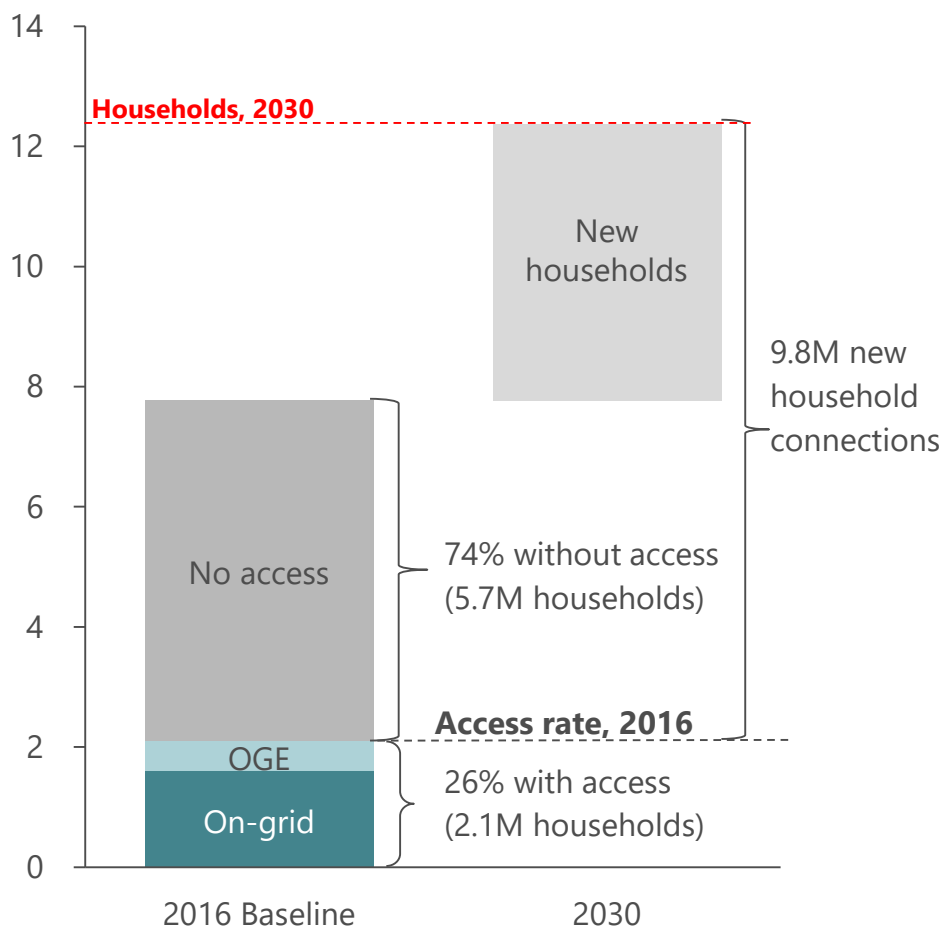
Enable more effective communication and coordination in the off-grid energy sector in Uganda, resulting in better resource allocation and accelerated progress in achieving universal access

To reach universal access by 2030, UG must add 9.8M connections

74% without access; 4.6M additional by 2030

Households, by access type²

Millions



Investment & coordination required to reach

- SE4All defines universal access as 98% electrified by 2030¹
- Uganda set targets in Vision 2040 to reach 100% access

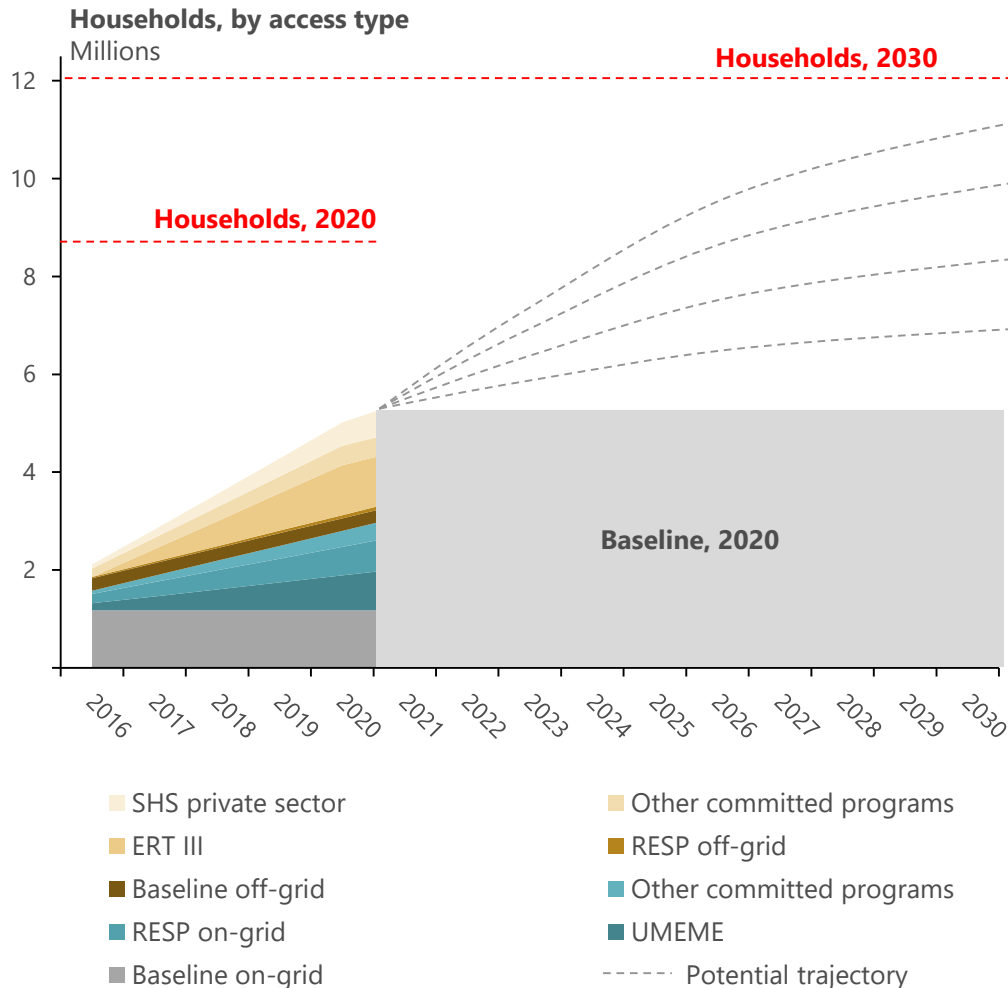
To meet any of these targets, we must understand Uganda's current trajectory

- To determine a feasible path to universal access, it is first necessary to assess current growth trajectory of on- & off-grid to understand size of additional efforts needed

Based on size of gap, determine path to provide access

- Explore possible paths to fill, providing estimates on investment needed and roles to execute

At 2020, >4M expected to remain without access; reaching universal access requires improved understanding of unserved segments



We expect ~4M hhs unserved by 2020...

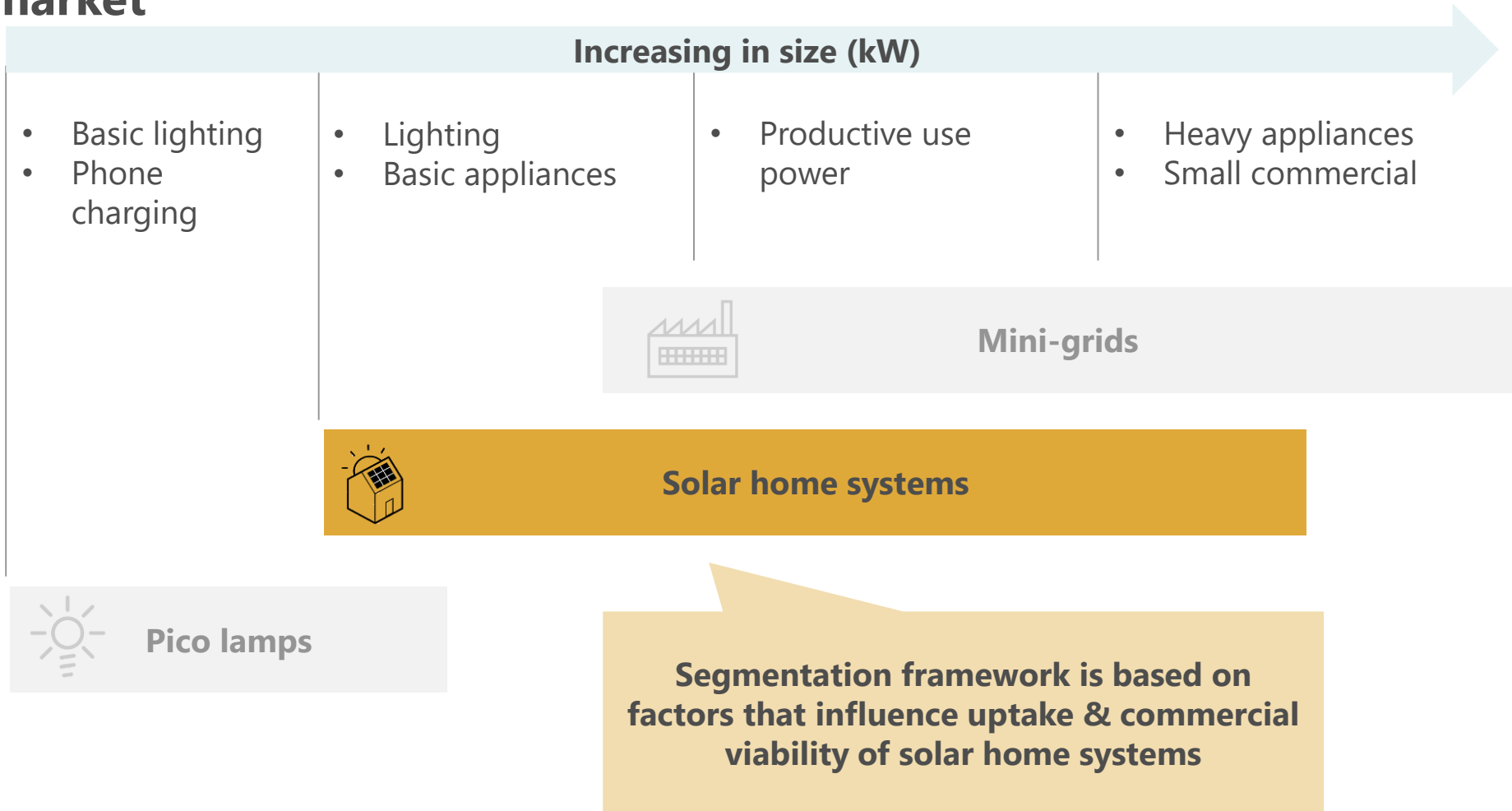
- Despite considerable growth, current trajectory predicts ~4M hhs (~20M people) will remain without energy in 2020

...with an additional ~3M hhs to serve by 2030

- Pop'n will grow to ~12M hhs at 2030, so there will be ~3M add'l hhs to serve if population growth rates hold at 3.3%
- In order to reach these, a number of interventions will need to happen in addition to macro economic growth

Exploring sustainable and scalable off-grid solutions for unserved population segments is necessary if Uganda is to reach universal access by 2030

Despite planned grid expansion, over 4M hhs will still remain unserved; important to explore off-grid solutions available in the market



Framework for segmentation

In order to develop strategies to serve, our framework examines affordability as key theme for segmentation

What influences consumer decision to purchase and consistently pay for SHS?

Ability to pay

Willingness to pay

Level of income

Product pricing

Awareness

Perception

Value proposition

Trust

Wealth levels

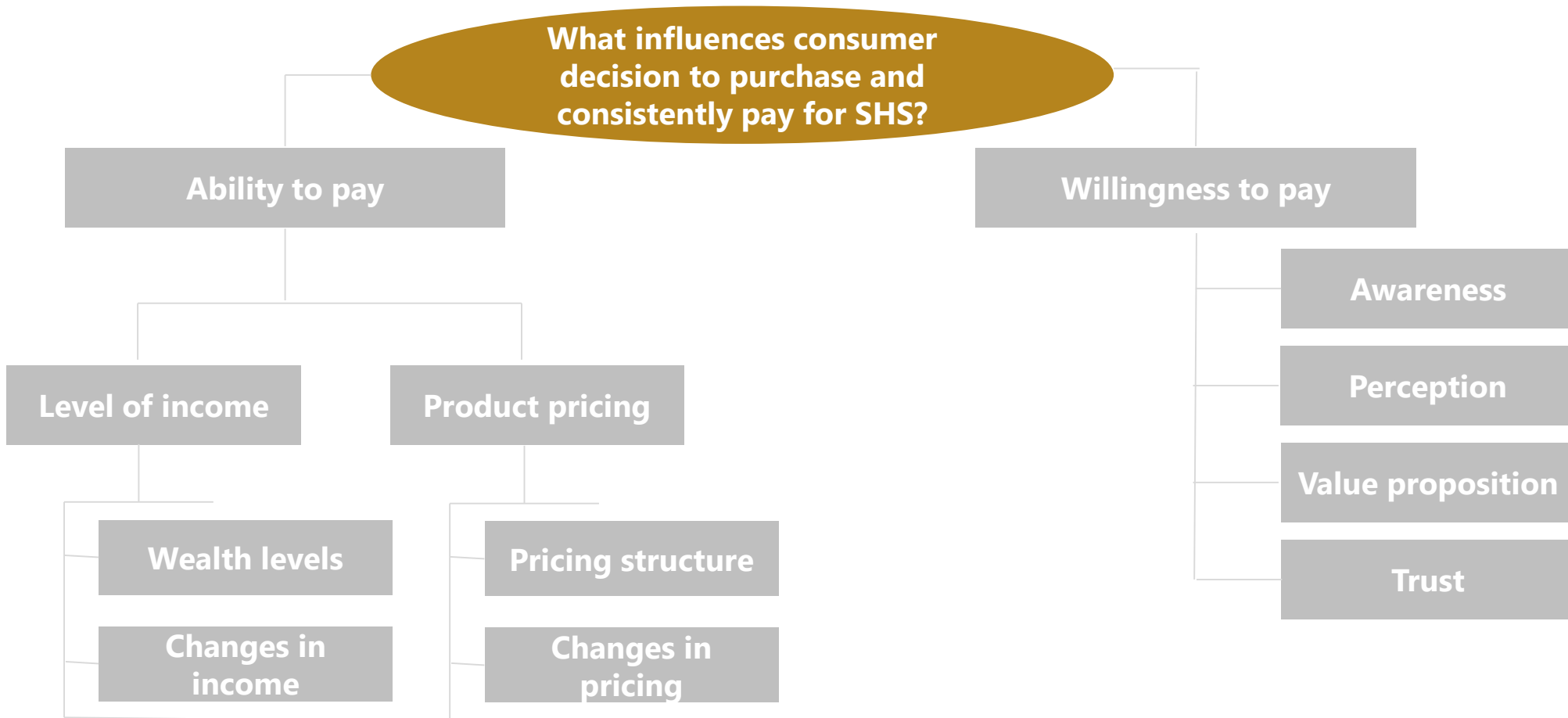
Changes in income

Pricing structure

Changes in pricing

Customers segmented based on how their purchasing power would be influenced by a change in income or price

Customers segmented based on their ambitions around energy, how much they understand or value solar, how adapted products are to their needs and who they trust to make a purchase



To predict consumer purchase we seek to examine what influences the fraction of income set aside to purchase and consistently pay for energy service given income constraints

What influences consumer decision to purchase and consistently pay for SHS?

Ability to pay

Willingness to pay

Examines consumer's disposable wealth, how it varies among consumers and how their ability to purchase SHS varies with change in income

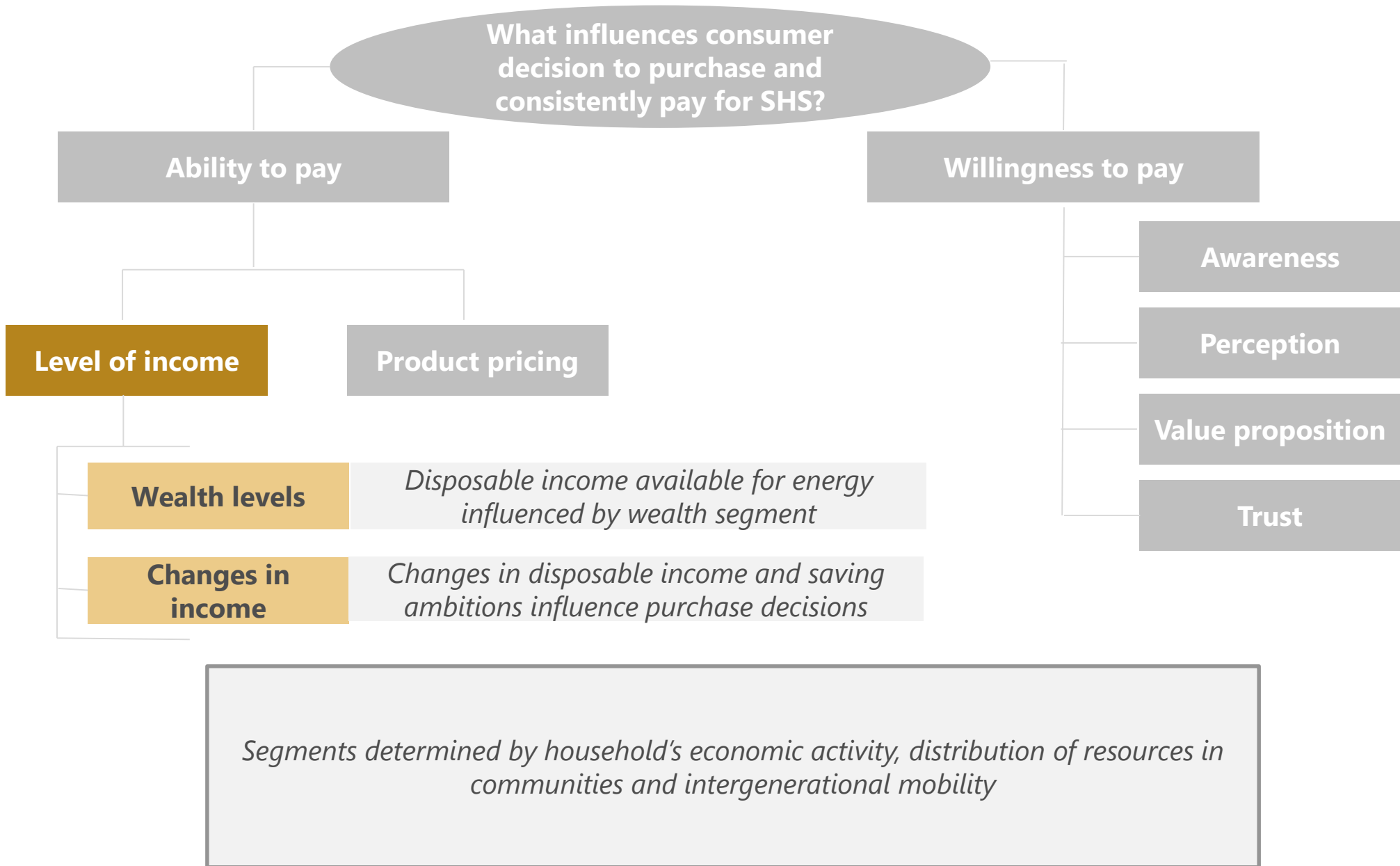
Customers are segmented based on how their purchasing power would be influenced by a change in income or price

Awareness

Perception

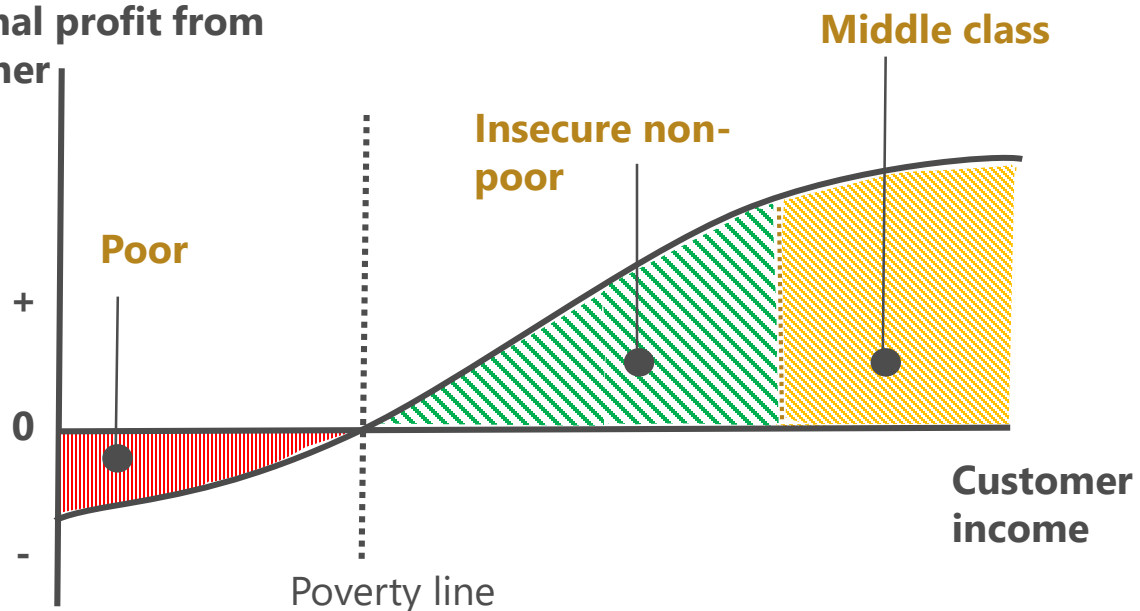
Value proposition

Trust



Level of income: Three key segments exist based on wealth levels in the region

Marginal profit from customer



- Expanded look at poverty puts into context ability to consistently afford basics, real income and ability to acquire credit to improve living standards
- Important to note that this is not a static state and operators can take advantage of opportunity for change

Middle Class	Households earning over \$10-\$20 dollars a day and who have a low probability of falling into poverty ¹
Insecure non-poor	Living above the national poverty line but on less than twice the national poverty line ¹ , these individuals are distinguished on account of the volatility of their incomes and the risk they face of becoming poor in the event of household shocks or economic hardship ²
Poor	Households living on less than \$1.25 a day ¹

Sources: 1. World Bank 2015 , 2. Azam and Imai, 2009, . [USAID Backsliding in Uganda](#)

Level of income: **Important to understand household & community characteristics to segment populations according to income**

In order to design strategies to serve the varying income segments it's critical to note the changes in perceptions of poverty that have changed as Uganda's socioeconomic environment has evolved

- Poverty indicators no longer perceived as only poor clothing, sanitation and housing but now expanded to include land and labor constraints, food security and higher education as now a large majority have access to basics
- This expanded look at poverty puts into context ability to consistently afford basics, real income and ability to acquire credit to improve their living standards

Community levers

- Percentage living in urban area
- Average household size
- Percentage with at least two meals a day
- Percentage owning a mobile phone
- Percentage with agriculture as primary source of income
- Percentage who sleep in iron roofed houses

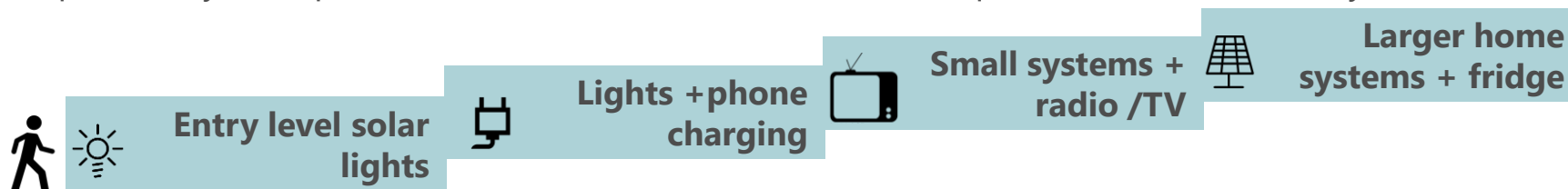
Household levers

- Households hiring out land
- Households selling labor
- Households with terminally ill persons or headed by widows
- Households without food security
- Households with no or low paying jobs

Level of income: Consumer demand largely less sensitive to changes in income for similar product sizes

Any changes in household income in turn influences change in income expenditure which doesn't fully translate to an increase in demand

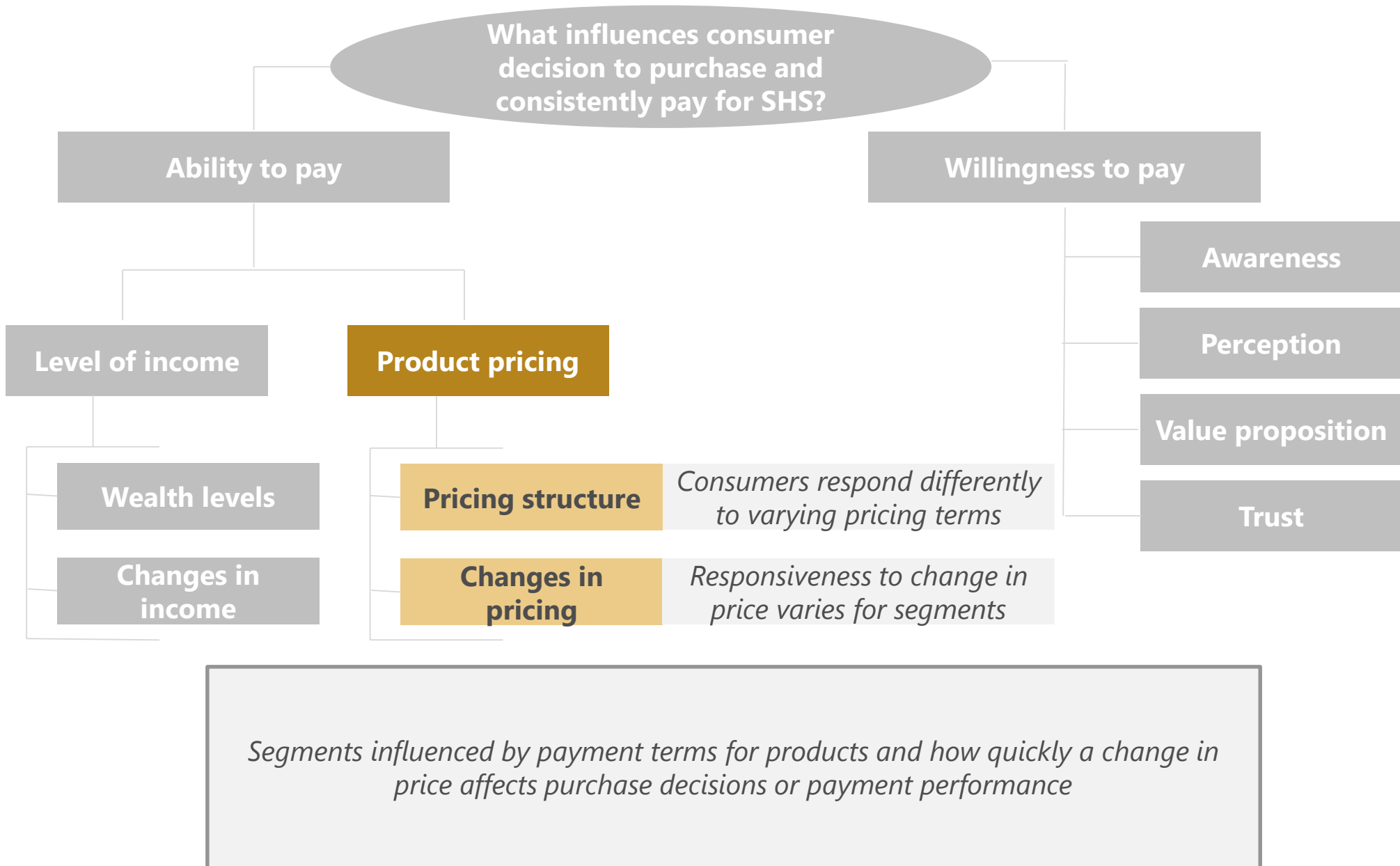
- Surveys show that households spend ~30% of their disposable income on energy for lighting, heating and cooking; the relative value spent on lighting is even less in lower income groups as it is not seen as high priority to other household needs
- **For the poor**, an increase in income will allow them to include energy in their expenditure and acquire entry level products. Further income increase will require added functionality.



- **For the insecure non-poor and middle class**, an increase in income doesn't translate into an implied increase in spend on lighting given the relative importance in their household budgets; households will spend more on energy products if there's an implied improvement in lifestyle or if it will enable them to earn even more income

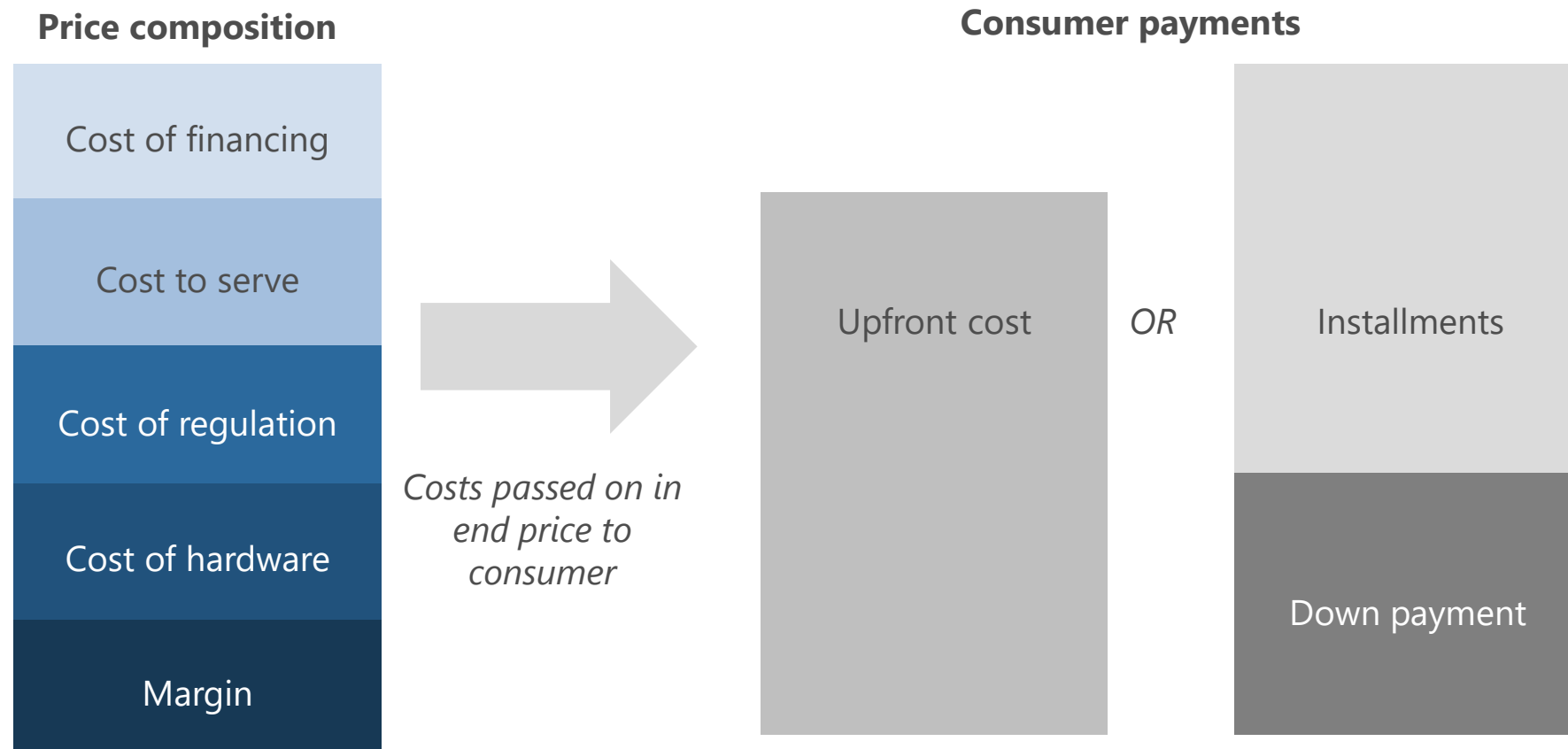


Will more likely acquire credit for a system if it has an appealing add-on that will enable them to acquire other needs like ag inputs or loan for iron-sheets, etc.



Segments influenced by payment terms for products and how quickly a change in price affects purchase decisions or payment performance

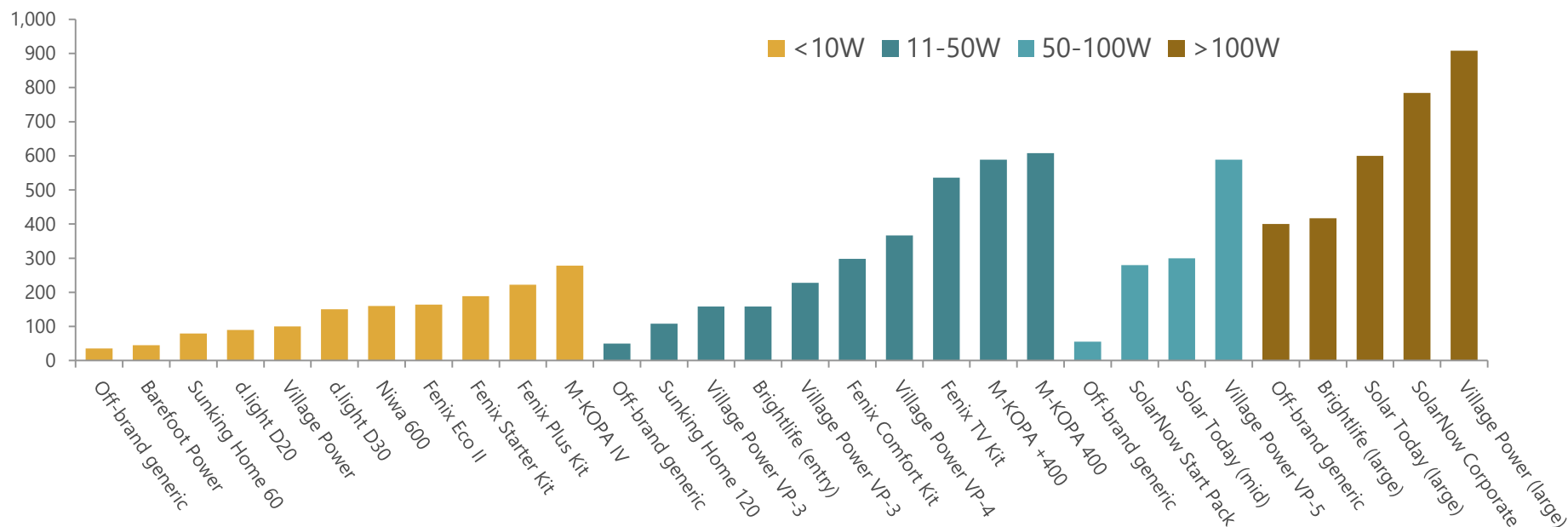
Product pricing: High price elasticity in SHS market means important to examine price influencers & how this is passed on to consumers



In thinking about how to make SHS affordable for the varying income levels, it is important to understand how the different levers of price can be pulled to enable efficient mode of service delivery to end consumers

Product pricing: Large ranges of pricing in UG market for similar sizes implies consumers have high price elasticity

Unit cost USD



Consumers are quite sensitive to changes in prices for products even within same sizes

- Some operators have recorded a marked 20% increase in sales when they reduced price for their systems within the same range of size¹
- While changes in pricing are a key influencer, important to remember that consumers consider this along with factors such as quality, and trust in brand

Product pricing: Trade offs between profitability and affordability inform the payment terms for SHS consumers

Payment terms

- Should products be offered on credit or paid upfront?
 - Some customer segments would rather pay upfront due to aversion to credit
- What hybrid terms can exist to allow for varying preferences?

Loan tenor

- Should you be offering longer or shorter term loans?
 - While long term loans are more affordable for low income households, they offer a higher default risk and cost of financing
- How can tenor terms allow for customers to build credit and upgrade?

Flexibility in payment

- Does product offering allow for lumpsum or seasonal payments?
 - For those with lumpsum incomes, energy payment would compete with either basic necessities or ability to save for other assets
- How can terms be flexible to allow for faster payment with less deposit?

Payment logistics

- What is the most cost efficient and convenient way for customers to make payments?
 - Agent access, cost of mobile money or network reach influence payment performance

Providers should allow for flexibility in model in order to target and effectively reach different segments

Product pricing: **Considerations to make SHS affordable focus on bringing down hardware costs & increasing operational efficiency**

Cost of financing

- Cost of financing for the business dependent on type of investment and investor terms. Consideration needed to manage return expectations if business is to shift focus away from peri-urban higher income customers

Cost of regulation

- Cost of regulation based on any regulatory charges and taxation. SHS in UG not regulated and currently have tax exemptions for solar generating technology

Cost to serve

- Cost to serve based on distribution model, service level offered and logistics around payment. Varies due to difference in infrastructure, population density; relevant partnerships could ease service costs

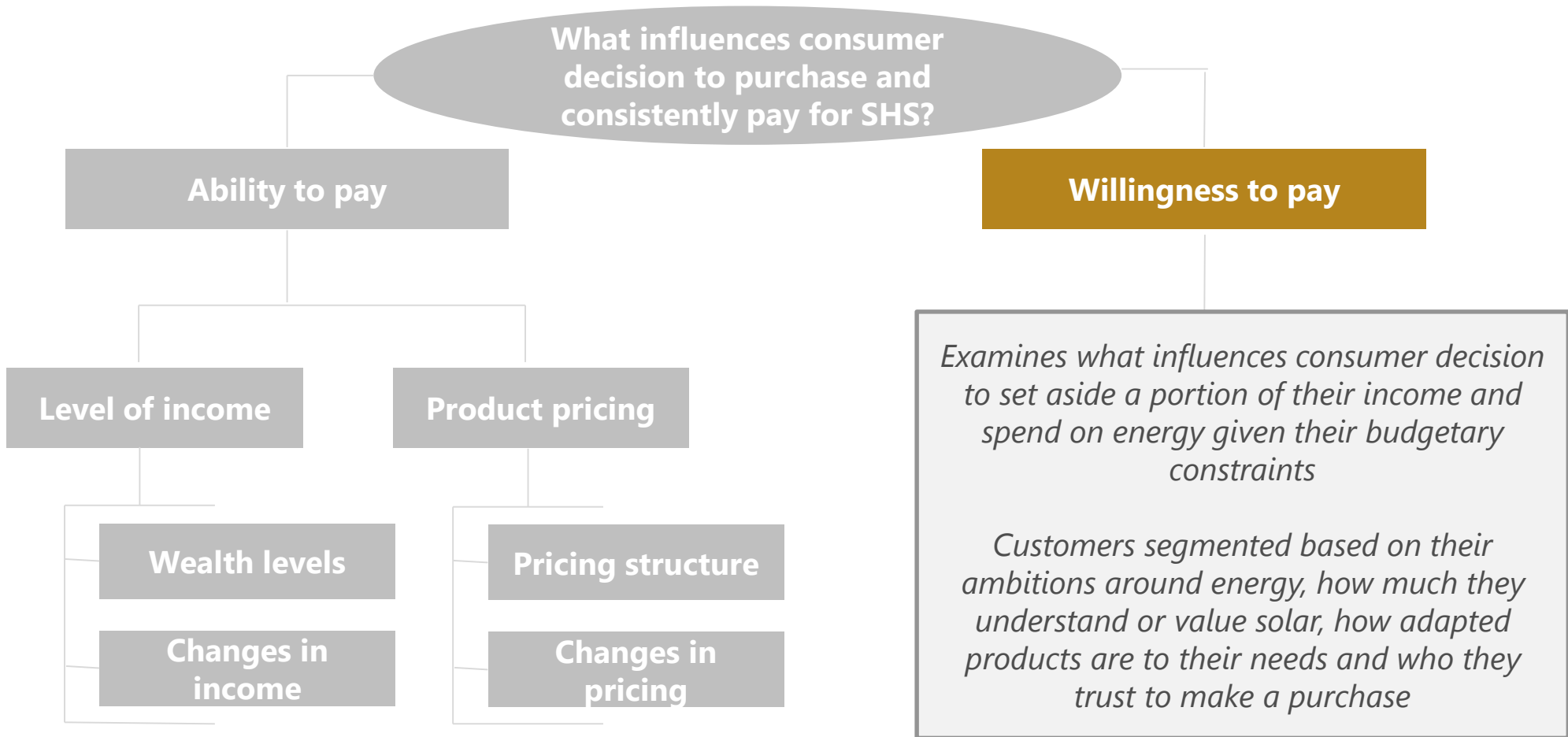
Cost of hardware

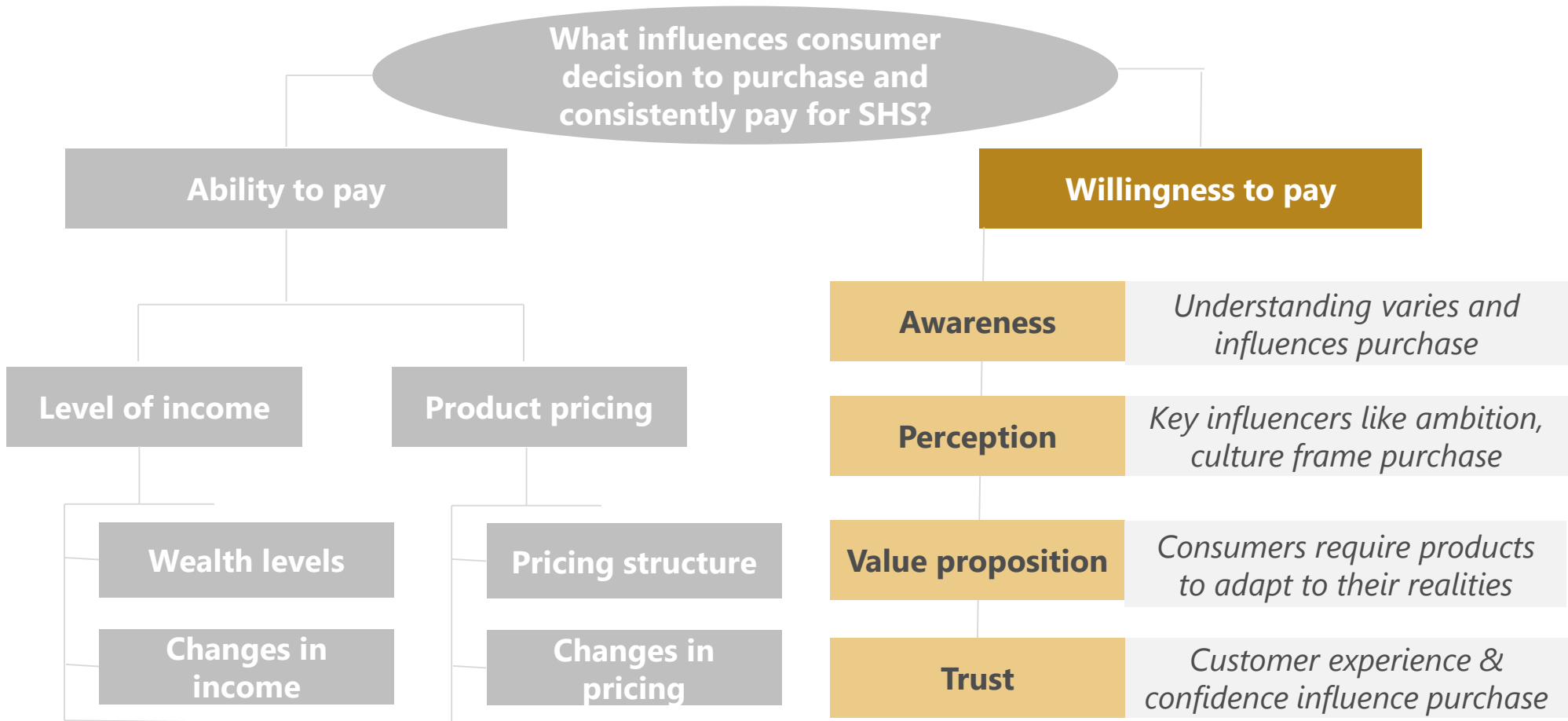
- Cost of hardware based on size of systems, quality and add-on functionality. Influences product devt & the balance between providing quality products with multi functionality

Margin

- Margins for SHS based on trade-offs between profitability and scale to hard to reach areas. Consideration that reaching lower-income and more remote customers entails higher costs and lower margins

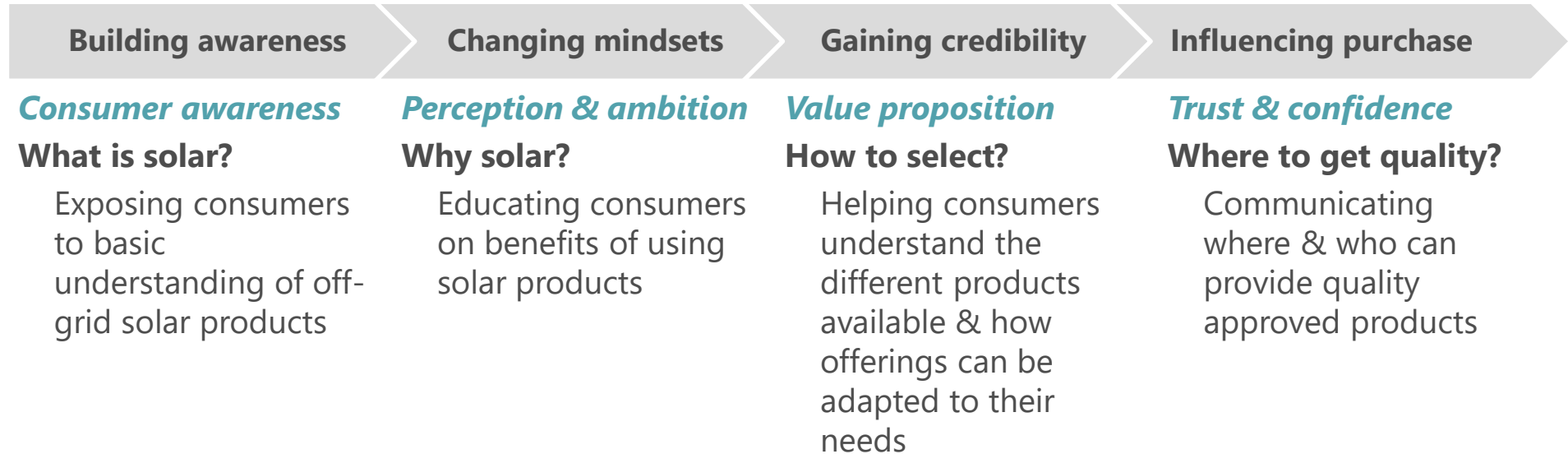
Key role for government and other stakeholders key in creating favorable enabling environment





Willingness to pay: Important to understand consumer behavior towards solar in order to improve perceptions in the market

To influence consumer decision-making and increase solar uptake, effective communication is needed across 4 key areas:



Effective communication in this process should incorporate a concrete understanding of the target audience:

- What cultures and norms influence purchase & ambitions around energy for this group?
- Who are the influencers and decision makers in the community?
- What value and benefits are most appealing to specific regions and groups?

Willingness to pay: **Consumer understanding has been limited thus far by challenges in quality, technical support & distribution**

Building awareness

Do consumers know what products are available to substitute their current energy source? How does this reconcile with their current energy ambitions?

- Strategies through traditional advertising & social media have not been particularly effective to disseminate information in these communities

Changing mindsets

Do consumers understand the benefits of these products over what they are using?

- Surveys show that consumer consideration for value differs from cost, safety, health and so on; this varies with age, income levels & aspirations¹

Gaining credibility

Do consumers trust that the products will give value for money?

- In the past, a number of unbranded products flooded the market & were mostly low quality which has lowered confidence for many consumers
- Limited tech support presence for malfunctioning products has further lowered trust

Influencing purchase

What are the most efficient distribution channels for different operators?

- Independent surveys have shown that consumers are likely to purchase energy service products from people they know and receive a lot of their information by word of mouth rather than through bulk advertising channels²; meaning consistent effort is needed to gain consumer trust and loyalty

Next steps

UOMA is deepening research within specific population segments and kicking off pilots to explore new strategies for unserved

Continuing research and disseminating findings to reach all relevant stakeholder groups

- Continuing to develop and distribute insights to 100s of stakeholders to build awareness, and contribute to discussion on segmenting unserved populations in Uganda and designing scalable strategies to reach
- Holding targeted sessions with various groups to receive feedback on ability to bring these solutions to market; including workshops and 1:1 consultations with private sector, development partners, and government agencies

In parallel, identifying stakeholders that have demonstrated interest and capacity to partner, design and test necessary proof-points to explore unserved population segments

- UOMA is seeking to identify and bring together partners (operators, donors, other stakeholders) who have interest and capacity to pilot solutions to reach unserved segments
- Team is working directly with partners to articulate and develop planning for scalable solutions, including defining timelines and necessary incentives
- Targeted support being offered to stakeholders to accelerate their work in exploring previously unserved population segments, including designing innovative pilots and developing Terms of Reference to scale project funding, as relevant

Continuing to mobilize stakeholders and kick off innovative pilots



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