



Value chain development of a clean-burning solid biofuel in southern Africa

Introduction

Bush encroachment in Southern Africa affects 120 million hectares, causing environmental degradation, reduced plant diversity, water scarcity, soil degradation, and impacting farmland productivity and water security, posing a costly removal challenge.

The EU Horizon 2020 “SteamBioAfrica” project seeks to add value to bush biomass by converting it into a clean-burning solid biofuel using the superheated steam (SHS) technology. This solid biofuel will benefit both households and industries in Botswana, Namibia, and South Africa.

The CSCP and its partners play a key role in analyzing and developing the value chains for the solid biofuel through working with MSMEs, to enhance the renewable energy sector in the three countries.



Materials and Methods

The survey sample size of 299 respondents cover stakeholder groups of households, wholesalers, and retailers in the three countries. Sample size was determined based on the project’s timeframe and available resources.

The value chain analysis used qualitative and quantitative methods such as surveys, interviews, and literature reviews. Data underwent triangulation and frequency analysis, and conclusions were drawn through logical inference.

Hotspot/sweetspot analysis was used to identify risks, gaps, challenges, and opportunities in cooking and heating energy value chains, aiding the development of the biomass-based value chain. This effective analysis prioritized action in specific areas.

Target Group	Botswana	Namibia	South Africa	Total
Households	N=99	N=60	N=39	N=198
Wholesaler	N=13	N=5	N=10	N=28
Small scale retailers	N=48	N=15	N=10	N=73
Total	N=160	N=80	N=59	N=299

Conclusions

To establish sustainable value chains for long-term commercialization of the new solid biofuel:

- In Botswana, target industrial users as the primary consumer group in order to create initial demand.
- In Namibia, brand the biofuel as an “improved” product, that is better than charcoal. Besides the clean burning property, offer competitive pricing and

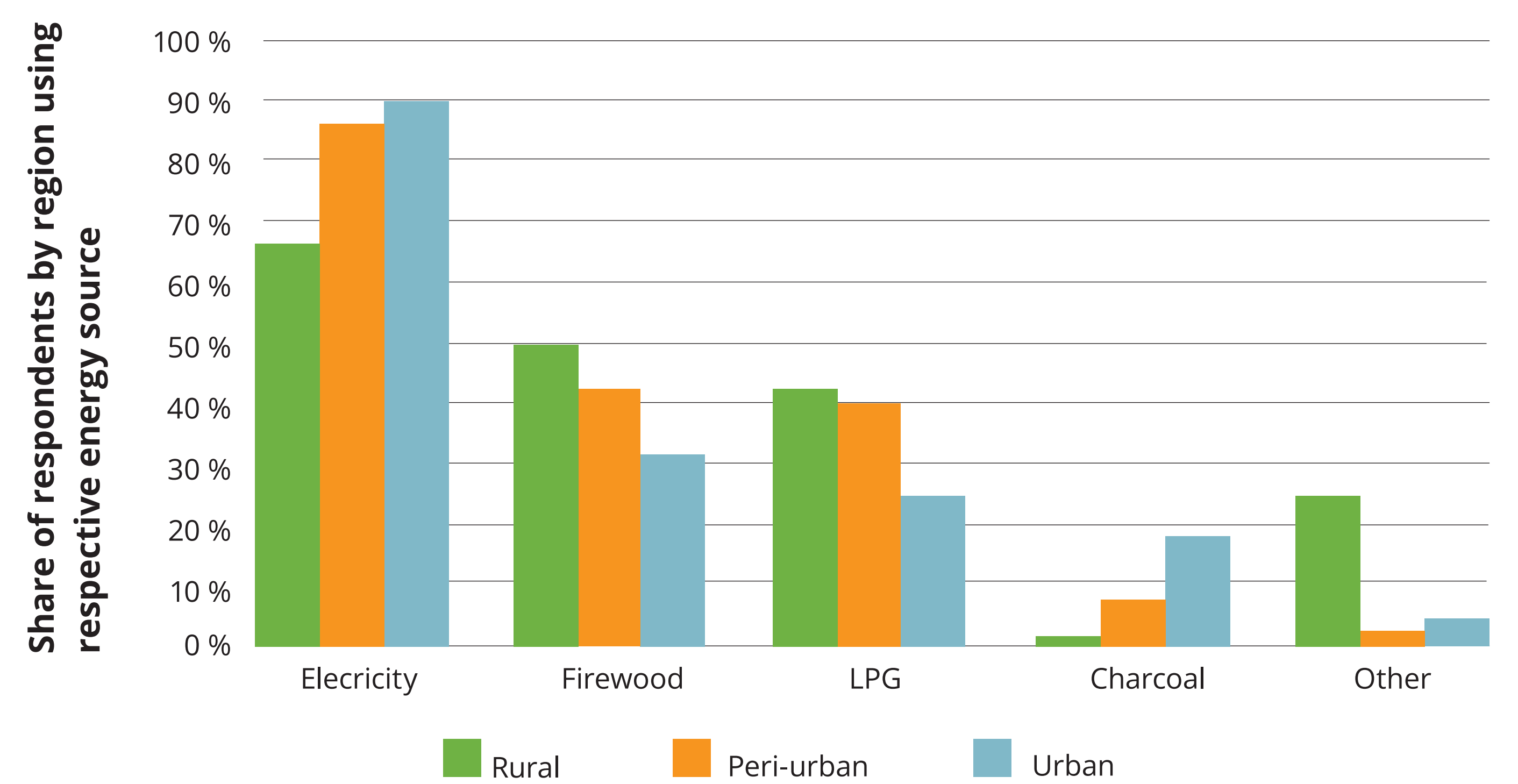
strategic marketing message. Exporting MSMEs can consider utilizing existing charcoal export channels to drive demand.

- In South Africa, incentivize adoption of the new energy source by considering delivery services or alternative payment methods for households heavily reliant on electricity and gas.

 **The project will identify potential new viable business models as part of the commercialization strategy that will support the scaling-up or replication of the SHS cleaner technology in Southern Africa.**

Results

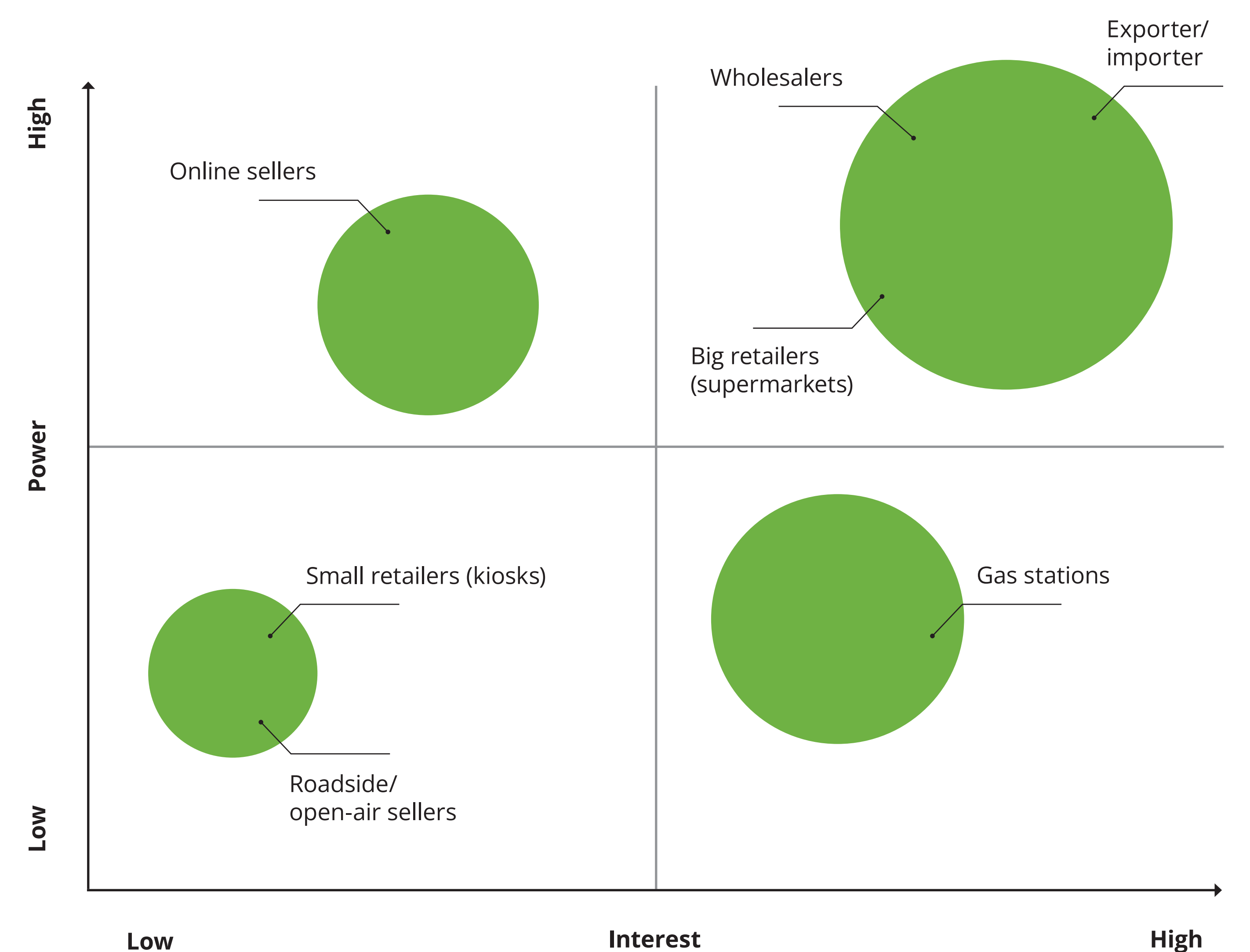
Use of energy source in % of respondents in Botswana, Namibia & South Africa




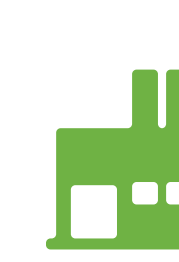
- In the three countries households in urban, peri-urban, and rural areas mainly use electricity for heating and cooking.
- Firewood and LPG are additional sources relied upon by peri-urban and rural households.

- Charcoal usage is generally low, except in urban areas where it is primarily used for leisure activities (“braai” or barbecue) rather than daily household needs.
- The energy usage trends in urban, peri-urban and rural areas can represent important challenges (hotspots) in the value chain development of solid biofuel.


Market influence of wholesalers / retailers



 **Small-scale sellers** such as kiosks and open-air vendors have limited power and interest to influence the market. They primarily serve household consumers and have a smaller market share and presence. With a right incentive, these sellers can leverage their consumer-facing position to introduce and create initial demand for the solid biofuel.

 **Big retailers** (supermarkets), wholesalers and exporters/importers can help create initial demand for the biofuel to support the

replication of the SHS cleaner technology in the three target countries, which eventually will drive down the costs at the consumer end.

 **Wholesalers** and large retailers hold significant influence in the biomass-based market. However, introducing a new product like solid biofuel may not attract their interest as there is currently no demand for it, posing risks for wholesalers and retailers.