



# Electricity from Cashew Shell: The Business Case

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TechnoServe

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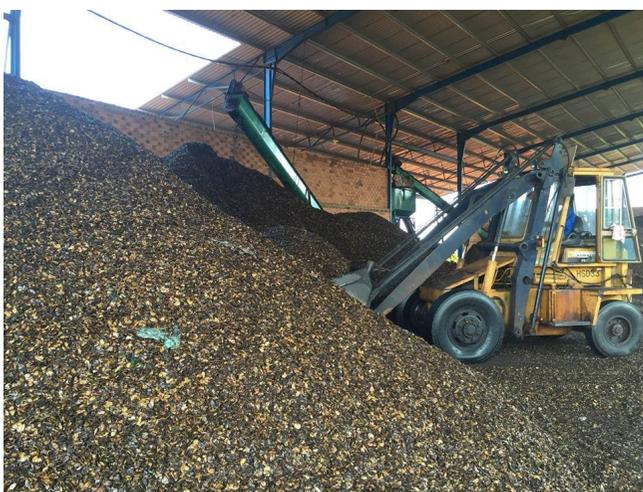
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# Cashew Shell: Waste or Resource?

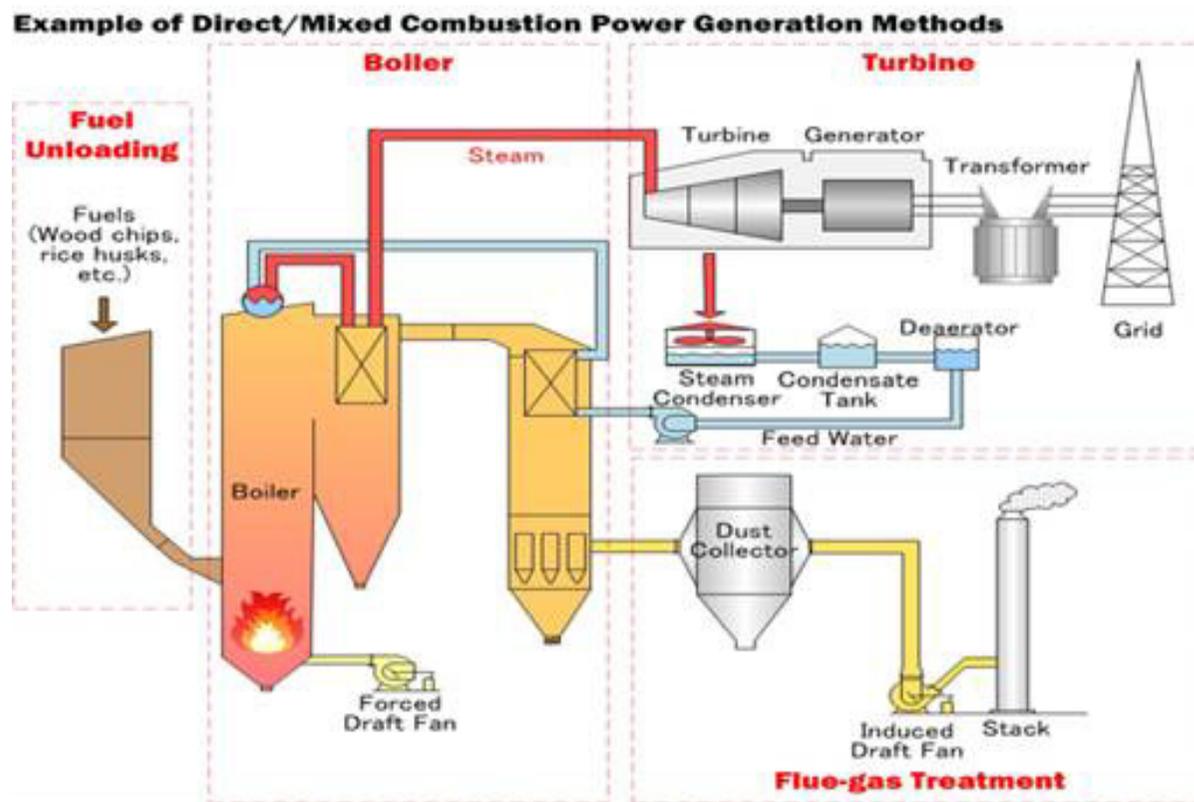


- Upwards of 70% of RCN by weight is from Cashew Shell
- Some processors have invested in CNSL extraction
- For each kg of RCN, approximately 0.5kg of de-oiled shell is generated as a byproduct
- Approximately 20% of RCN shell can be used for steam needs in processing
- The remainder is a waste disposal challenge; for small processors without CNSL plant, big challenge

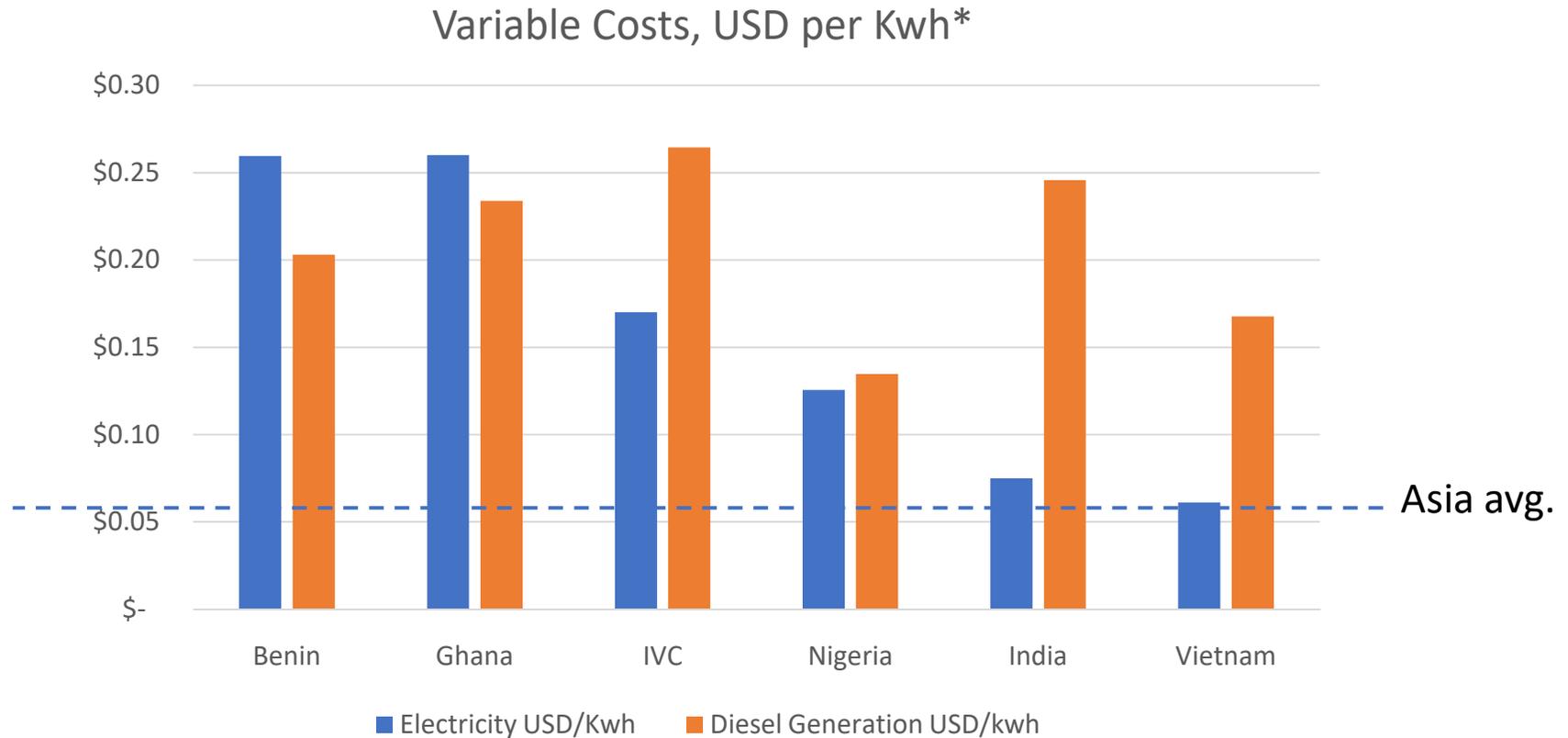


In Benin we anticipate at least **24,500 MT per year** of shell waste by 2022

# Technical Feasibility exists for energy generation with adequate scale



# Electricity Costs disadvantage African Processors



\*Estimates at peak/ standard industrial rates, excluding levees and fixed fees

# Competitive Impact on Processors



- Increased scale increases energy consumption
- Increased mechanization also needed for efficient scale, increasing electricity costs further
- Total potential costs over \$400k/yr for large scale mechanized production

# Business Case for Power Generation from Cashew Shell



Example: Co-generation of steam and Electricity, 24hrs operation

Description	Units	1 MW	2 MW
Useful Power available	KW	800	1700
Capital investment	USD Millions	0.87	1.53
De-oiled Cashew Nut Shell Requirement	MT	7,908	15,816
Operating cost of power	USD/kwh	0.060	0.060
Fixed cost of power	USD/kwh	0.026	0.025
Simple pay back	years	2.9	2.5
Estimated IRR	%	18.70%	25.10%

# Key Considerations



1. Cost of grid electricity and diesel
2. Reliability and quality of grid electricity
3. Scale – substantial own production of shell and consumption of energy
4. Availability of alternative fuels
5. Ability to find synergies with other processors
6. Opportunity cost of selling de-oiled shell to other industries
7. Market for energy produced – own needs, feed-in revenues, microgrid



Thank you!

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