



SUSTAINING AGRICULTURAL GROWTH THROUGH FOOD PROCESSING DEVELOPMENT: A CGE ANALYSIS FOR BENIN

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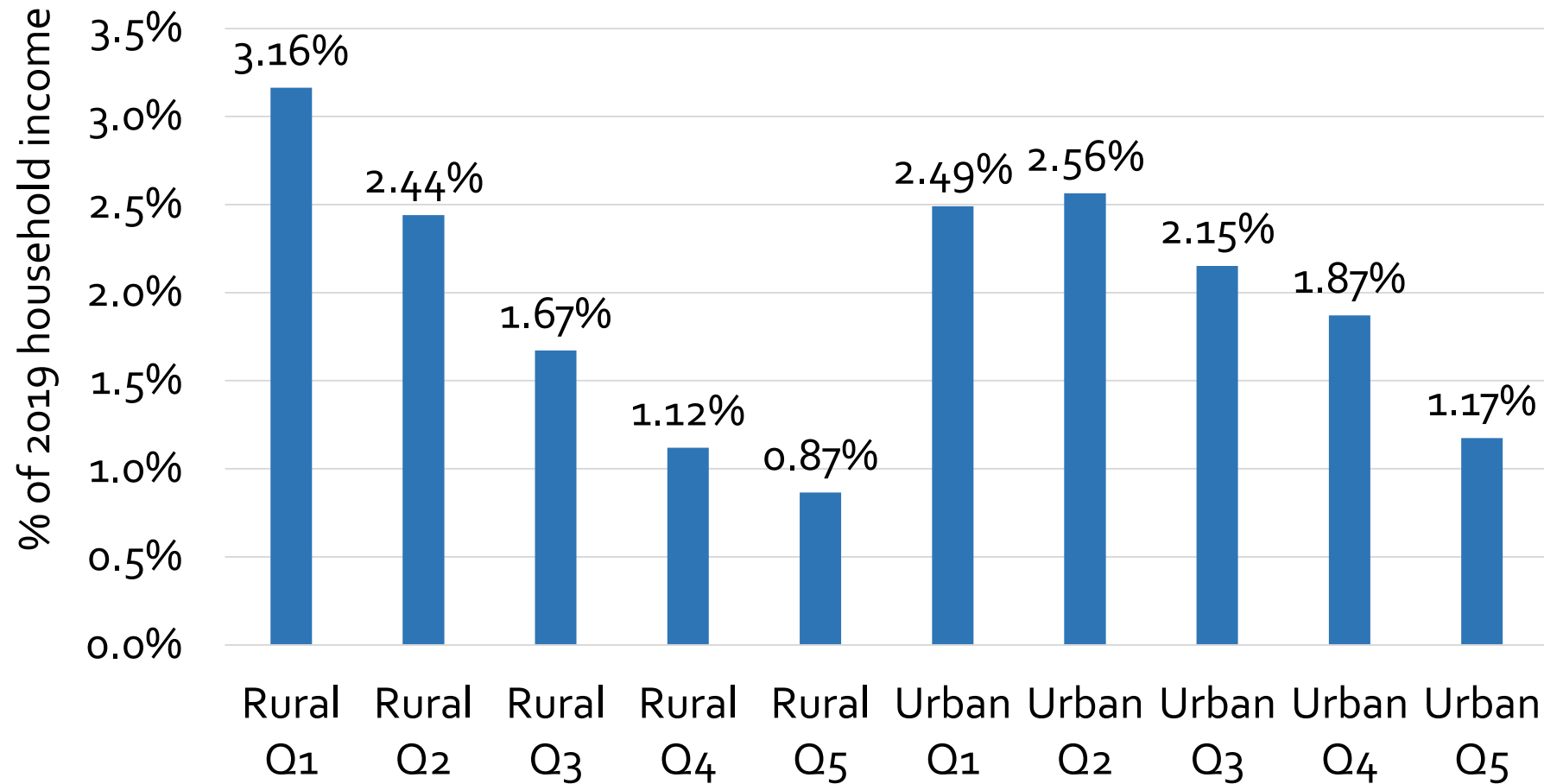
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Background (1/5)

- In the last decade, most African countries follow the African Union's (AU) and regional unions' policy orientations to set up agricultural development plans
- Benin: PNIASAN → enhance productivity and value chain development (How?)
- Agricultural development without suitable value chain development → possibly negative effect on farmers (Johnson & Islam, 2004; Gunawardena, 2012; Cazcarro et al., 2016; Gupta et al., 2018)
- Increasing productivity → lower agricultural prices and income loss for poor rural households in Benin (Grethe et al., 2020)

Background (2/5):

Welfare effect of food processing development to process 50% of production



- Food processing development → improves livelihood of population (Kinkpe et al., 2021)
- How exactly can food processing develop?

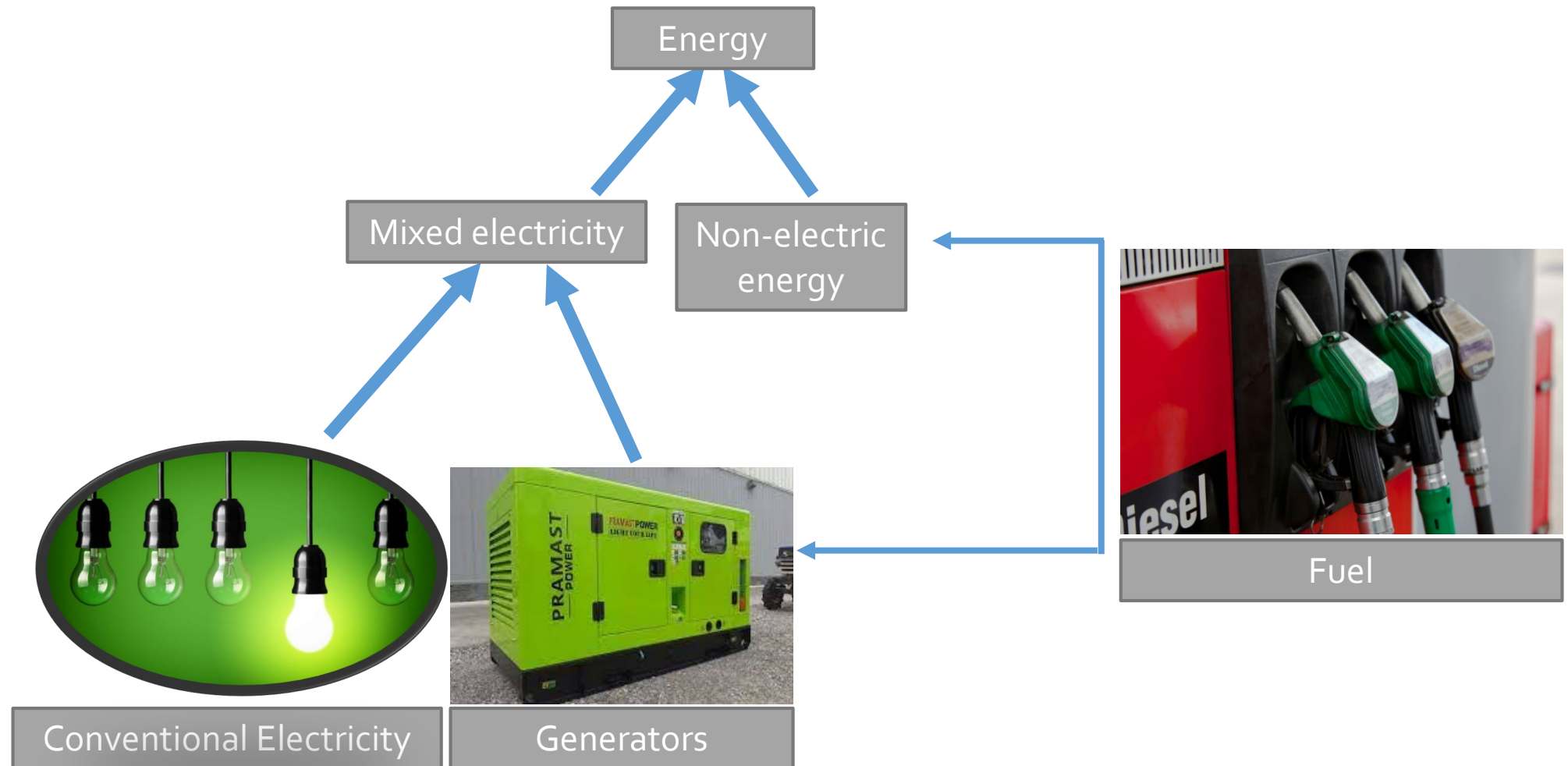
Source: Adapted from Kinkpe et al. 2021

Background (3/5)

- A SWOT analysis of the food processing sector shows that
 - lack of stable electricity supply is one of the most important bottlenecks (Kinkpe et al, 2021)
 - Benin is not yet fully covered by electricity networks, especially in rural areas (Ayosso, 2018; Somalon, 2020)

Background (4/5)

Energy use in food processing sector in Benin



Background (5/5)

- Efforts to improve the situation
 - Benin is striving for self-sufficiency in energy and is improving its distribution network for stability of electricity supply (Akinocho, 2019; Somalon, 2020) : 50% of self-sufficiency in 2019
 - Industrial zones are being built for food processing with stable electricity supply

Research question (1/1)

Can a stable and sufficient electricity supply induce development of the food processing sector and thereby enhance overall economic development in Benin?

Data base (1/1)

- **2019 Social Accounting Matrix (SAM) for Benin** (Kinkpe *et al.*, 2022)
 - Agriculture: 29% GDP; Food industry: 3% GDP; Non-food industry: 3% GDP; construction: 5%; services: 60%
 - **Modifications**
 - Sectors
 - Stable electricity (activity and commodity) and broiler poultry meat trade (activity)
 - Production factors
 - Unskilled and skilled labor;
 - Capital: agricultural, food-processing, new electricity plants and network for food processing & other industry and service capital;
 - Land: permanent crop, annual crop and husbandry land

Modelling approach: Model and Closure rules (1/1)



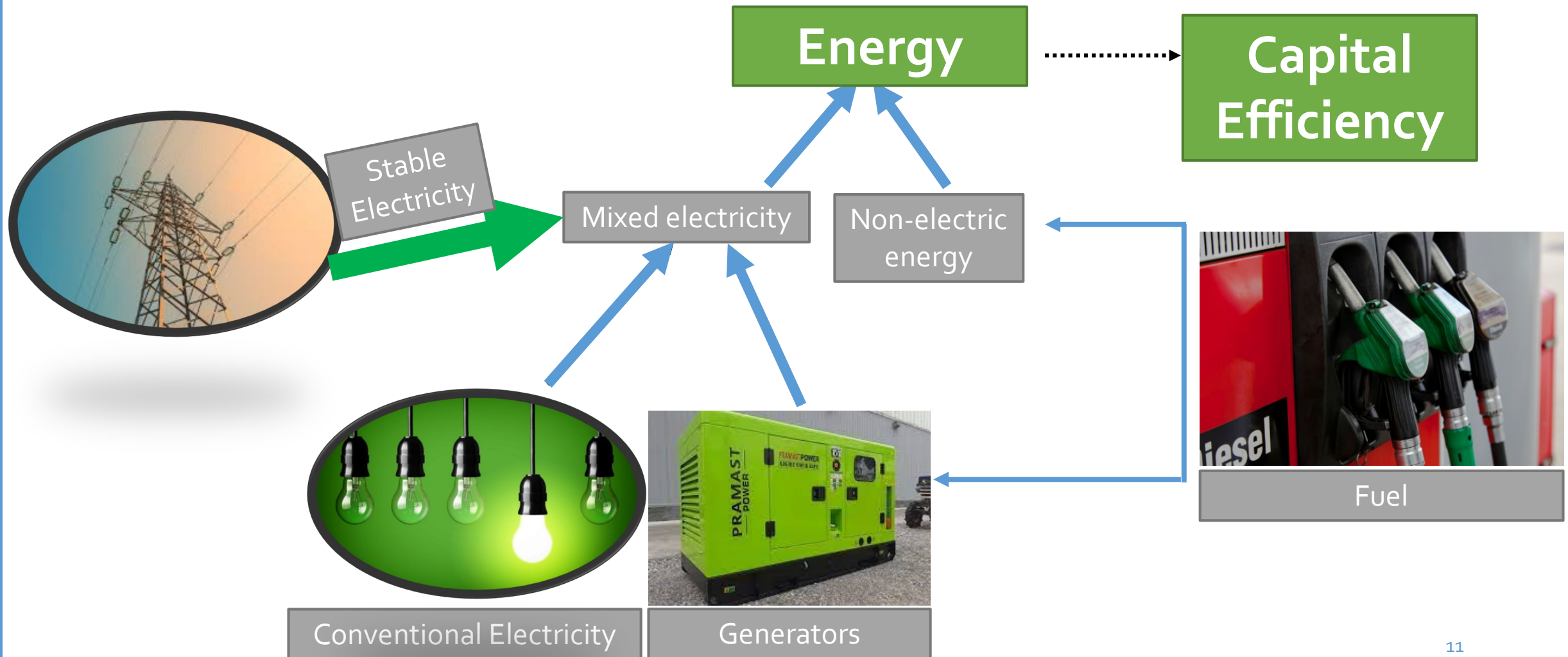
- **Model:** STAGE 2 (McDonald, 2015)
- **Closure rules**
 - Fixed exchange rate regime
 - Fixed CPI (numeraire)
 - Savings-driven investment
 - Flexible government saving and fixed household income tax rate
 - Small country assumption: fixed world market prices

Modelling approach: Scenarios (1/3)

Scenario to develop food processing by increasing stable electricity supply:
increasing endowment of **new electricity plants and network for food processing**

Modelling approach: Scenarios (2/3)

Energy use in food processing sector in Benin when stable electricity grows



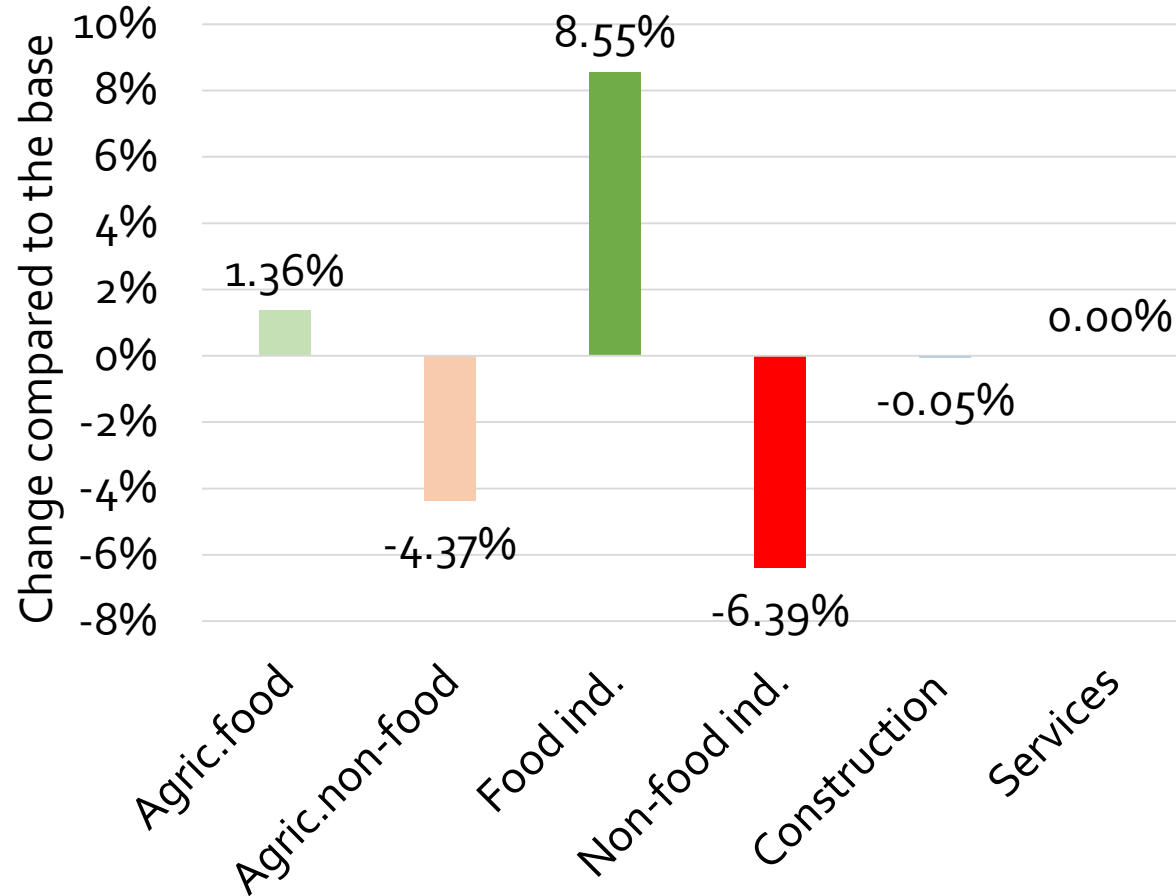
Modelling approach: Scenarios (3/3)

Activities \ Scenarios	STEL (double stable electricity): Percentage increase in capital efficiency (%)
Bicycle poultry meat	26.13
Broiler poultry meat	26.13
Other slaughtering	26.23
Pineapple juice industry	13.70
Pineapple juice artisanal	15.67
Cashew kernel industry	34.88
Cashew kernel artisanal	0.00
Cashew apple juice	0.58
Other vegetable and fruit processing	29.70
Other food industry	28.61
Beverages	29.86

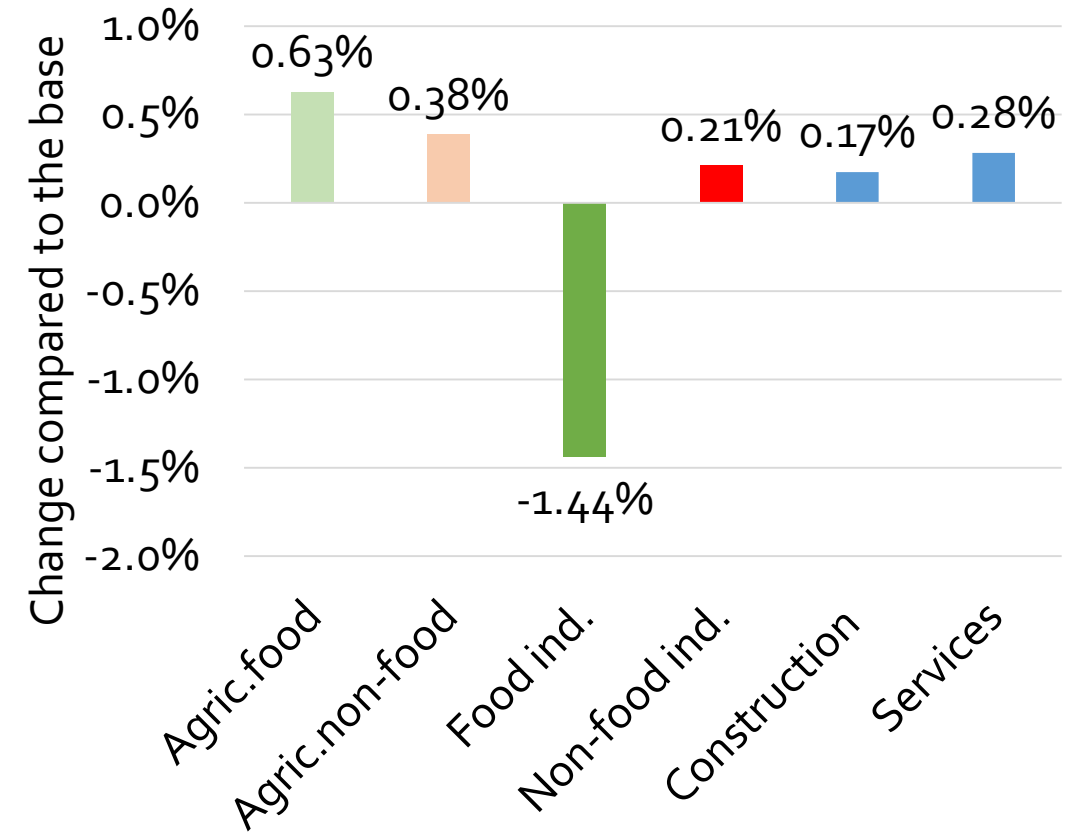
Effects on productions and prices (1/2):

Aggregate sectors

Production



Producer price

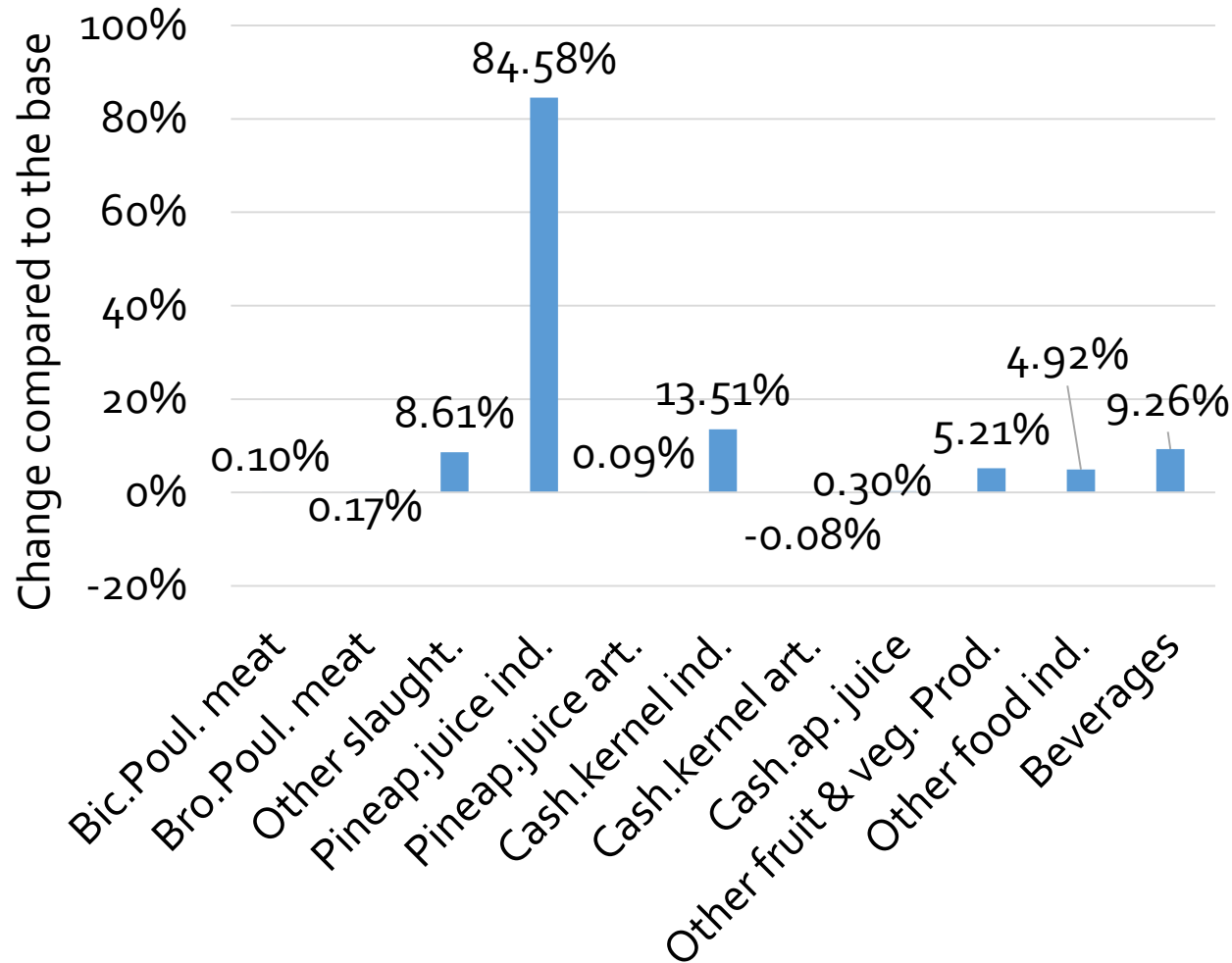


Effects on productions and prices (2/2):

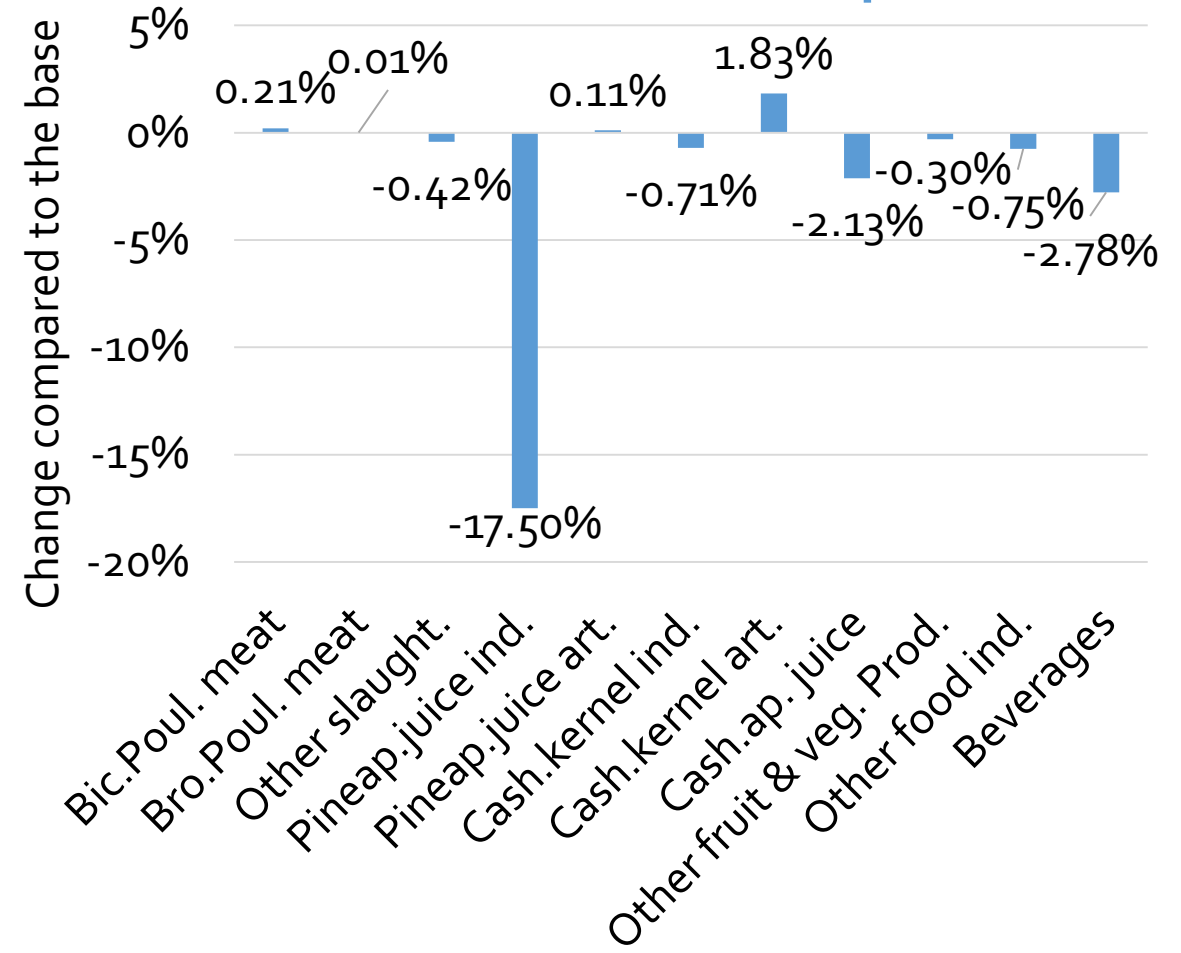
Food industry



Production



Consumer price



Conclusion and implications (1/3)

- More stable electricity makes the food industry grow
- Food industry growth is higher for industries with high export share and energy intensity
- The food industry development sustains agricultural growth
- The higher the industry growth, the higher the growth of the agricultural sector providing the respective input

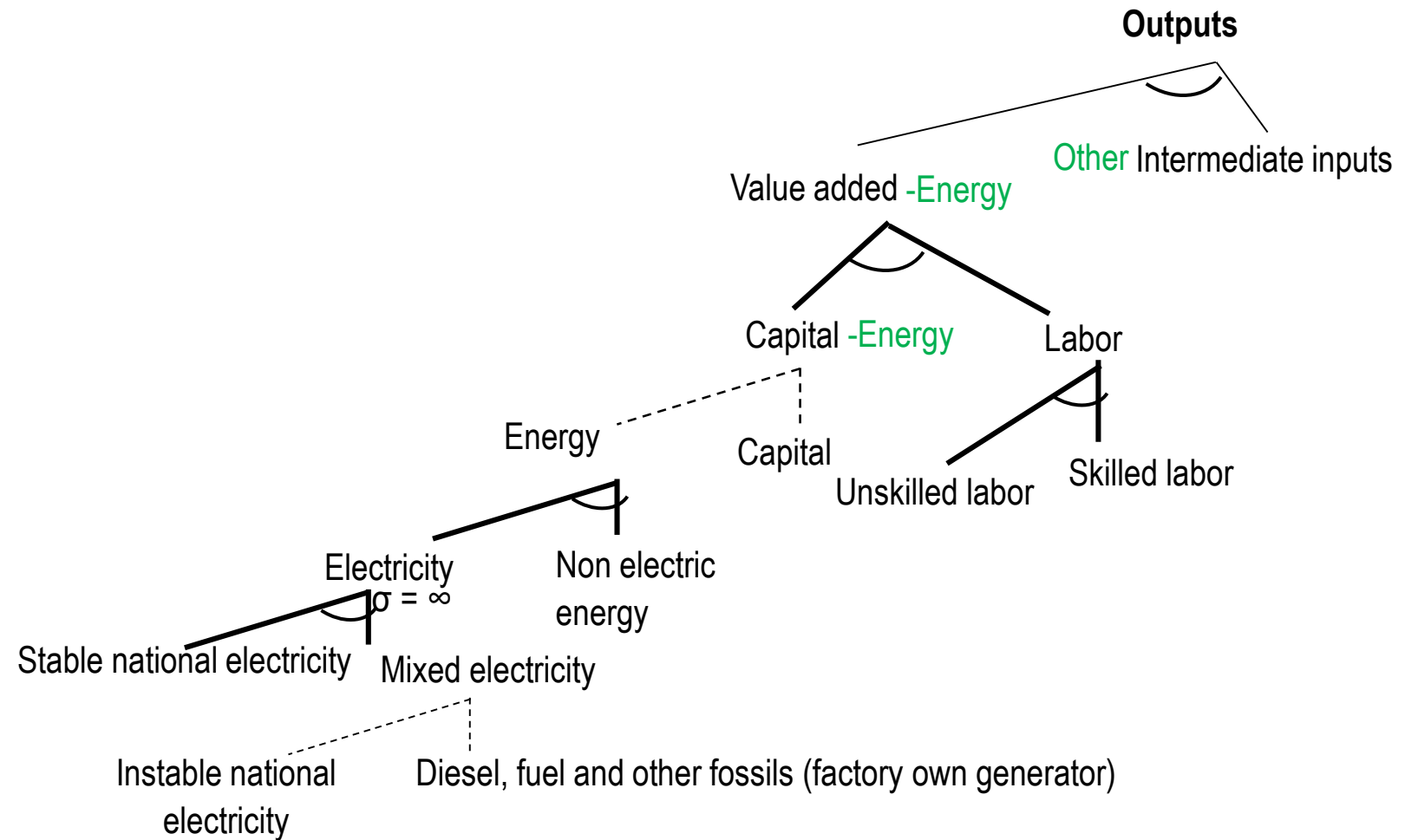
Conclusion and implications (2/3)

- Policy implication for sustained agricultural development
 - Invest to make electricity stable and available to develop food industry → better sustain agricultural development
- Further research
 - Extending the production nest ongoing

Conclusion and implications (3/3): Model development ongoing

Caption

— CES
- - - Leontief



THANKS FOR YOUR ATTENTION



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Sources (1/1)



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Effects on productions and prices (3/3):

Agricultural production

