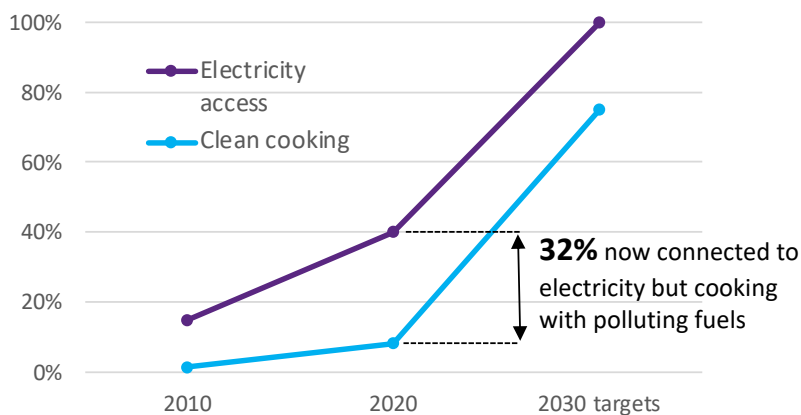
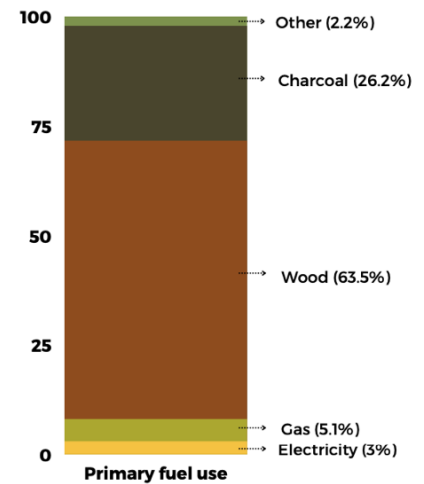


Current Situation: Electricity Access, Clean Cooking

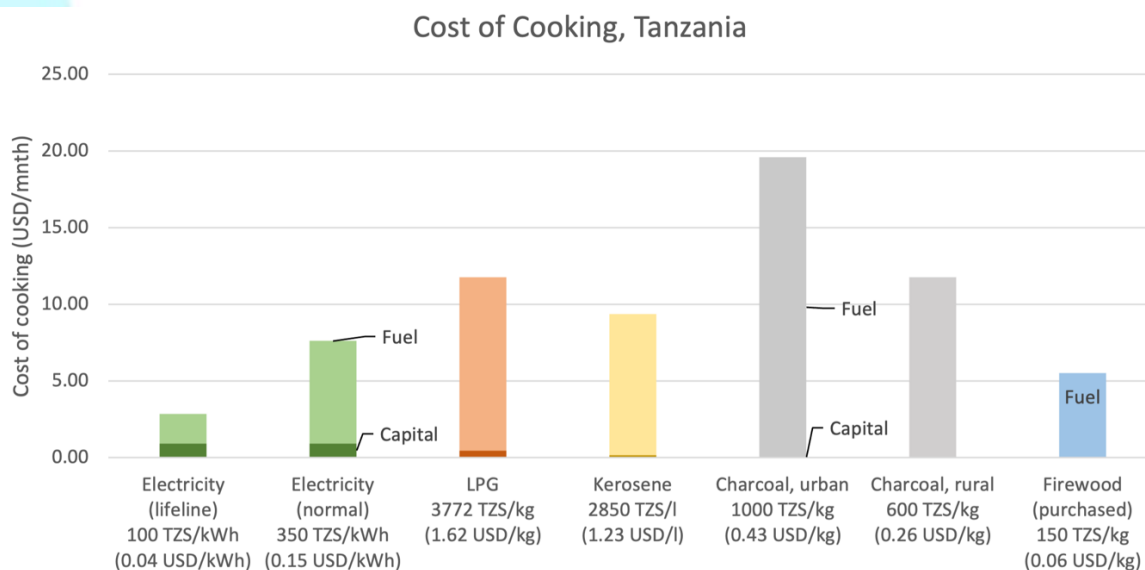
- 40% have access to electricity.
- 26% cook with charcoal, and a further 64% cook with wood, such that 90% cook with biomass fuels which are harmful to health and environmentally damaging.



Above: Electricity and clean cooking access. Right: Primary cooking fuel use. Both: Tanzania eCooking Market Assessment



Potential for eCooking



Cost of cooking over a month, using international averages for cooking energy demand from ESMAP (2020)¹ and local electricity/fuel prices from price surveys conducted in April 2022, and including cost of appliance levelized over stove lifetime (electrical appliance: EPC).

- **It is cheaper to cook with Electric Pressure Cookers:** 5 times cheaper to cook beans on an EPC compared to charcoal, 4 times cheaper compared to LPG².

¹ Energy Sector Management Assistance Program. 2020. [Cooking with Electricity: A Cost Perspective](#). World Bank, Washington, DC. © World Bank. License: CC BY 3.0 IGO.

² TaTEDO, 2020, [Tanzania eCookbook](#).

- **32% of people are connected to electricity and not cooking with it** – urban centres can be easily targeted where people have electricity access, it is reliable enough to cook with most of the time, but most people are cooking with expensive charcoal (75% charcoal is used in urban centres³).
- 92% of Tanzanian dishes can be cooked on electric pressure cookers according to the eCookbook.
- There is a large expansion in electricity generation coming on board – 2115 MW over the next few years will create generation surplus, and demand stimulation is a government priority.
- Clean cooking is a government priority with eCooking part of that future, and TANESCO have received a directive to promote eCooking.

MECS programme activity

- Working with TaTEDO since 2018 to do the feasibility research for eCook, finding eCooking is affordable, convenient, compatible with the menu.
- Working with TaTEDO and SESCO to develop a thriving market for eCooking, put in after sales repair and maintenance services, support service centres, raise awareness, reduce taxes, and explore institutional eCook.
- Discussions with TANESCO to explore and promote eCooking.
- Collaboration with FCDO Dar es Salaam on topics of institutional eCooking and household eCooking.

This material has been funded by UKAid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies.

³ Biomass Energy Strategy Tanzania, 2014.

Tanzania: Socio-economic and environmental costs and benefits

Using the World Health Organisation's (WHO's) revised "[Benefits of Action to Reduce Household Air Pollution](#)" (BAR-HAP) tool, we **quantify the expected economic, social and environmental benefits of a simple scenario of uptake at scale of electric cooking for Tanzania**. The scenario represents a programme of eCook stove investment, with the capital costs paid by the programme (donor, investor or government funded) and households making savings in fuel costs and avoidance of buying replacement traditional stoves. In addition, the wider set of economic, social and environmental impacts can be calculated, and the sum of all costs and benefits, which is the overall 'social net-benefit' of this transition for Tanzania.

Scenario modelled: 40% of households connected to the grid in Tanzania in 2020 but using charcoal as their primary cooking fuel transition to using an EPC by 2030.

The overall result is a very large economic benefit of the eCooking transition, with benefits shared between households and the wider society or country.

Details of the scenario assumptions and discussion of results are in the MECS [Tanzania eCook market assessment](#). (Note some results are a little different here, due to changes in assumption since the market assessment).

Table. (A) households transitioning in the scenario; (B) Net social benefit of the transition per year; (C) financial costs of equipment, fuel and programme admin; (D) social and environmental benefits (in both physical units and then monetised)

(A) Grid connections projections and eCook target		Population (million)	Housholds (million)	
National population, 2020		59.40	12.24	
Grid connections, 2020		21.30	4.39	
Of which, using charcoal as main fuel		14.98	3.09	
Transition from charcoal to eCooking		5.99	1.24	
(costs are -ve, benefits are +ve)				Monetised Costs & benefits, \$/yr
(B) Total present value (ie net social benefits of the transition)				178,313,958
(C) Total costs of transition, programme + household				108,852,353
Private cost to households: total				130,908,865
Stove				552,500
Fuel				132,366,417
Maintenance				-2,010,052
Costs to programme: total				-22,056,512
Stove				-18,992,190
Fuel				0
Admin				-3,064,322
(D) Health, Time, and Environmental Benefits: total			Physical: change/yr	69,461,605
Health impacts total: DALYs avoided		Disability-adjusted Life Years (DALYS)	2,691	33,022,755
Mortality reduction		Years of life lost (YLL)	1,392	29,555,736
Mortality reduction		Lives	120	
Morbidity reduction		Years of healthy life lost (YLD)	1,300	3,467,019
Morbidity reduction		Cases	6,654	
Time savings in cooking		Hours	343,394,288	22,218,400
Time savings per adopting household		Hours/HH	276	
Electricity use, additional		MWh	425,174	
CO2-eq reduction (CO2,CH4,N2O)		Tonnes	1,065,855	13,467,234
Unsustainable wood harvest reduction		Tonnes	109,868	753,216

Figure. Monetized costs and benefits from the table, and how these stack to a net social outcome over ten years.

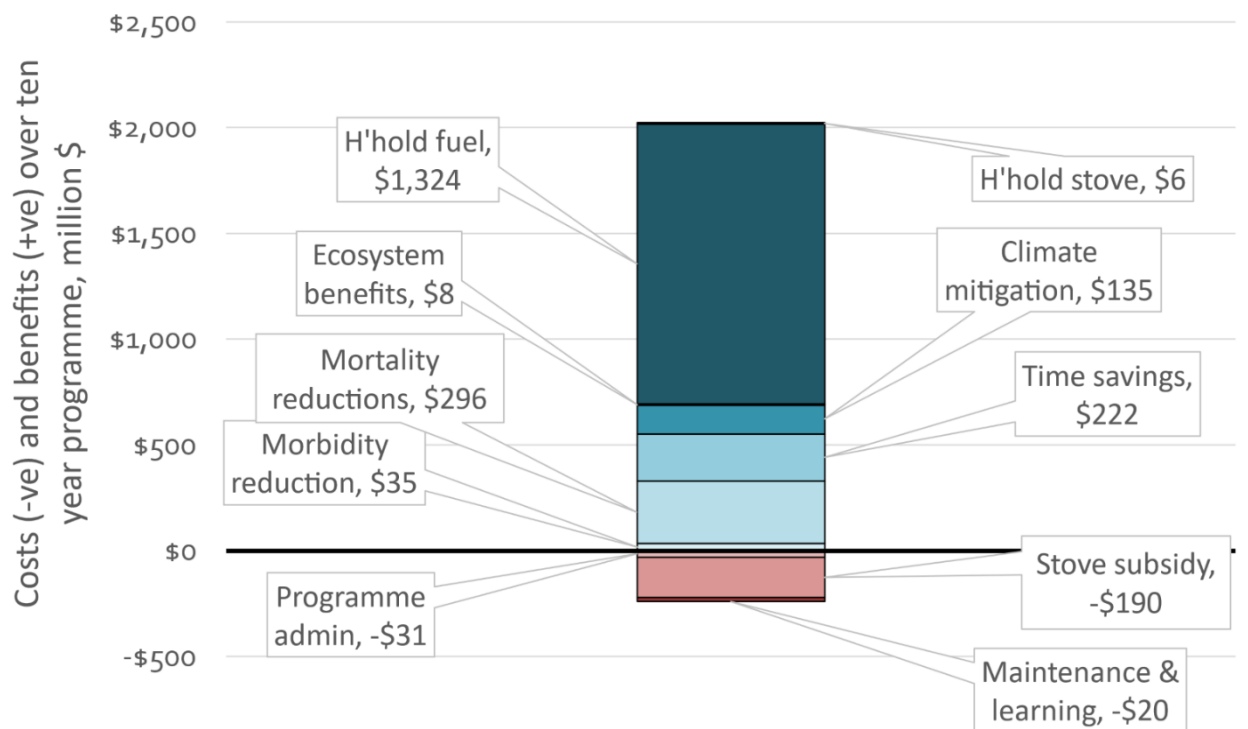


Table. Explanation of the physical impacts and their monetisation

Costs and Benefits	Physical effects	Monetisation of benefits
Morbidity (ill-health) reduction	Morbidity reductions of: chronic obstructive pulmonary disease (COPD); acute lower respiratory infections (ALRI); ischemic heart disease (IHD); lung cancer (LC); stroke (x)	The 'Value of statistical life' puts a monetary benefit to a year of life. Time lags are added to account for the time to develop illness, and a social discount rate is applied so the present value of these future health benefits are discounted. "Spillover" health benefits are also added, reflecting the improvements in outdoor air quality
Mortality reductions	Mortality reductions of: COPD, ALRI, IHD, LC, x	Multiplied by value of statistical life, and adding time lags and adding spillover benefits, as for morbidity
Time savings	Change in time spent cooking	Valued at a fraction of the unskilled market wage, to reflect the lower opportunity cost for time spent cooking relative to work time
Climate mitigation	Change in Kyoto protocol greenhouse gases (i.e. CO ₂ , CH ₄ and N ₂ O) plus three additional pollutants (BC, OC and CO)	Valued using a social cost of carbon
Ecosystem benefits	Change in unsustainably harvested firewood	Cost of timber farming multiplied by change in renewably harvested biomass
Household fuel	Electricity use and traditional fuel displaced	Fuel and electricity prices
Household stove	Avoided traditional stove replacements	Cost of traditional stove which is saved
Programme admin	Programme planning & implementation effort	Using local wage rates
Stove subsidy	eCook equipment required	Price of eCook stove
Maintenance & learning	eCook appliance maintenance + time for householders to learn eCooking	Maintenance costed using local wage rates; learning time costed using a fraction of the unskilled market wage