Improving access to clean cooking: eliminating the traditional use of biomass in low-income countries

Global emissions and energy use – residential and commercial cooking

Emissions today	Energy use today	Energy use in 2050	
		With a transition away from the traditional use of biomass and towards electric cookers	*+ With improvements to the energy efficiency of electric cookers*
0.7 $GtCO_2$ *3% of global emissions*	10,200 TWh *Of which, ~500 TWh is electricity*	↓ ~5,000 TWh *Of which, ~4,000 TWh is electricity*	↓↓ ~4,500 TWh *Of which, ~3,5000 TWh is electricity* *But relies on strong policy action*

The health and environmental imperative of clean cooking:

- Around a third of the global population, or 2.3 billion people, still cook with the traditional use of biomass (TUOB) i.e. the use of solid biomass (e.g., wood, wood waste, and charcoal) with basic technologies (e.g., open fires and basic stoves).[1] TUOB is incredibly inefficient (as little as 10% of the energy used is converted to useful heat) and has severe air quality and health and respiratory impacts.

- The energy transition for cooking is not just about transitioning from TUOB, gas and oil stoves to clean electric ones, but also to clean cooking fuels that will improve air quality, health and safety.

The transition to cleaner cooking fuels will differ across regions:

- Electric cooking meets both definitions of “clean” and is growing in importance as an energy source for cooking in high-income countries. Globally, however, it accounts for just 5% of total cooking energy.

- High-income countries should entirely electrify cooking by 2040, and China by 2050; electric cooking is healthier, far more efficient and it can be cost-competitive with gas/liquefied petroleum gas (LPG).

- In lower-income countries, the imperative over the coming decades is to eliminate the use of TUOB. But progress towards electrification will be much slower, given the higher cost of electricity relative to other fuel sources, and in some cases a lack of electricity supply and reliable grid infrastructure. This means the transition will likely follow several stages:

    1. A crucial interim solution in the 2030s is to install improved cookstoves, for example, with chimneys which reduce the amount of smoke in homes.

    2. Transition away from TUOB using liquefied petroleum gas (LPG). This is cleaner from an air quality perspective and cheaper than electric cooking and modern forms of bioenergy.

    3. Over time, electricity will play a slowly increasing role, as the costs of stoves fall, the price of solar PV panels and batteries decline, and grids are extended.

- By 2050, higher incomes and improved access to electricity should enable the vast majority of the world’s population to transition away from gas or oil cooking.

1 IEA (2023), *A Vision for Clean Cooking Access for All.*

Priority policy actions to tip the dial:

1. Promote clean cooking technologies with education and awareness campaigns, including community advocacy groups, training households and salespeople, and demonstration cooking classes.

2. Provide subsidies, grants and low-cost finance, along with international development finance, to lower the upfront costs and ongoing fuel costs while markets and supply chains are scaling up.

3. Implement minimum health and efficient standards for cooking technologies, especially improved cookstoves.