Kyrgyzstan Efficient and Clean Heating Stove Program

Republic of Kyrgyzstan

Population: 5.5 million people, 1.1 million households

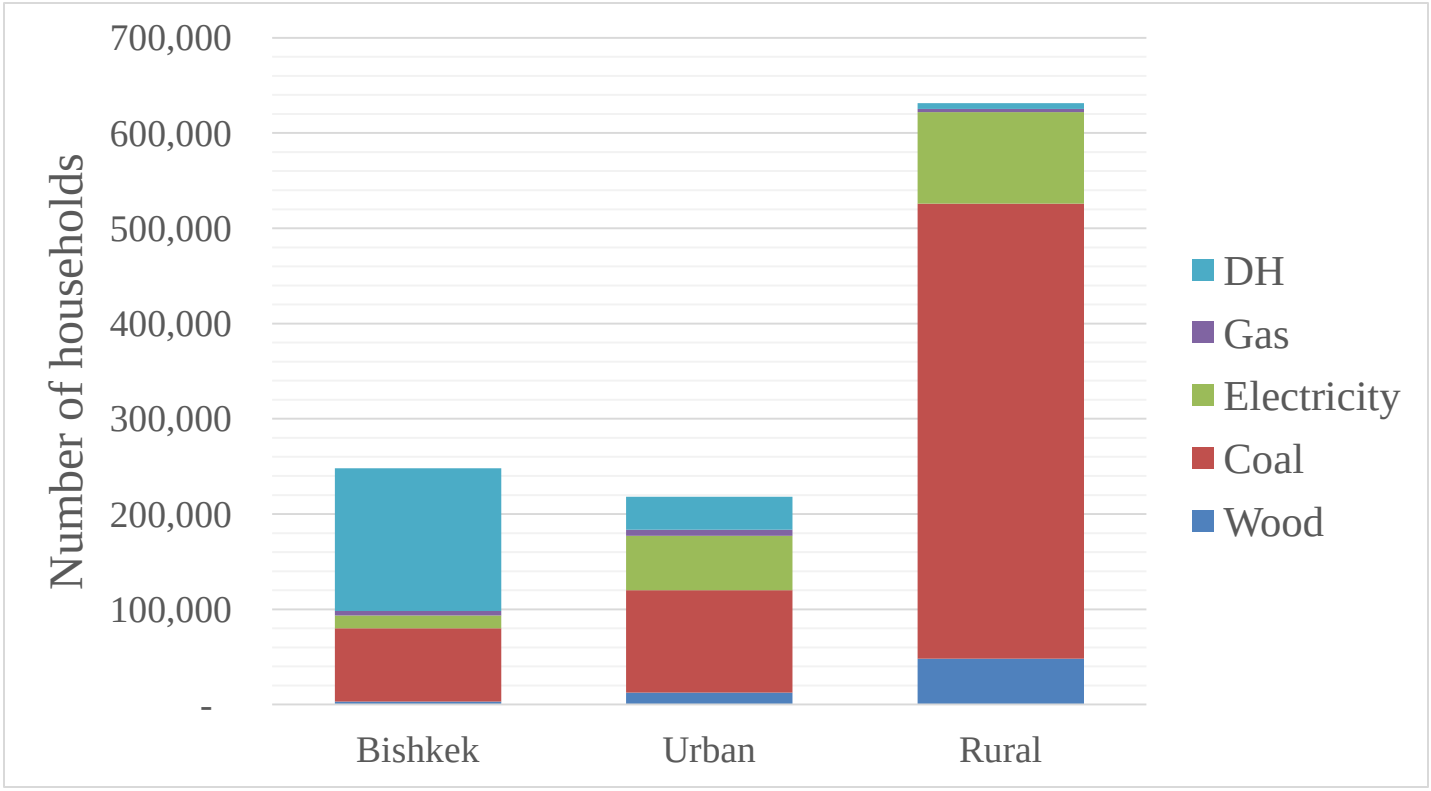
Territory: 198 000 km2

Tien Shan mountain range covers about 95% of the territory.
Nearly half of the country rests at 3.000 m above sea level.
Climate: Dry and continental

Phase I: Market Assessment

Overview of heating options

- 17% of households have access to district heating
- Among remaining households, 88% of households rely on solid fuel (mostly coal) for heating.



Phase II: Pilot Project during the 2016/2017 Heating Season.

Objectives of the Pilot Project

- Identifying and selecting efficient heating stoves
- Selecting households for stove installation and monitoring of results
- Support development of a stove testing protocol
- Monitoring results during heating season 2016/2017

Project partners

- Fresh Air project
- Local government authorities - Ayil Okmoty

Stoves selected for the Pilot

#	Model	Fuel	Type	Cooking	Efficiency	Fuel savings
1	KG2	Dung, wood, coal	Chimney, long chimney, heating wall	yes	70%	45%
2	KG4	Coal	Chimney, heating wall	yes	74%	50%
3	KG5	Coal	Central heating	no	75%	40%

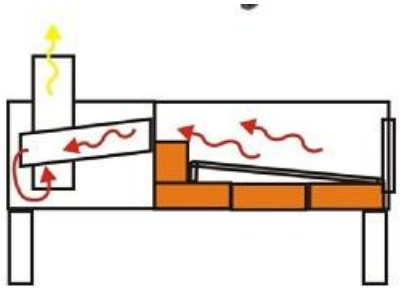
Three main models were selected for the pilot project

KG2

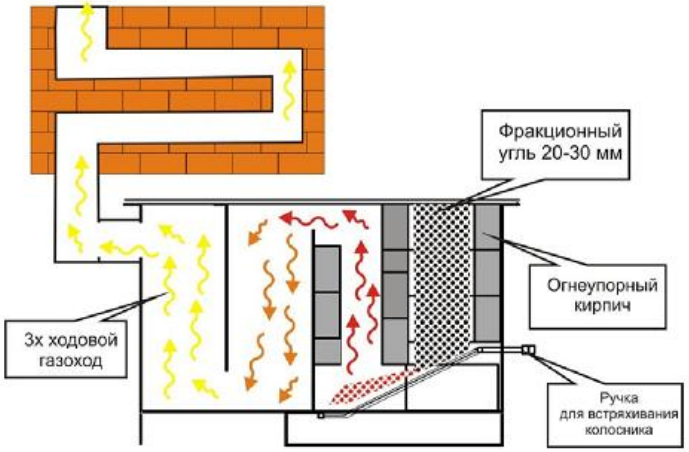
KG4

KG5

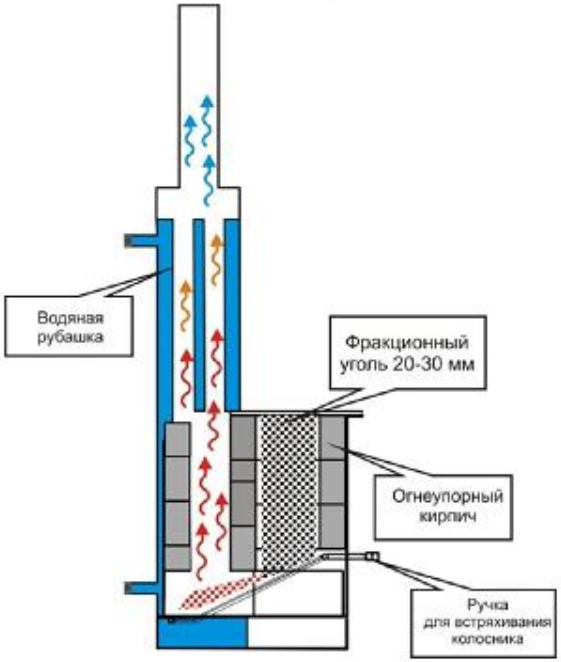
Selected energy efficient stove layout



Model KG2



Model KG4



Model KG5

CAMPalatoo
NGO for sustainable mountain development

Project area and households

Oblast	Households	Type of stove	Monitoring status
Jalal-Abad and Osh	20	19 coal stoves (KG4) 1 low pressure boiler (KG5);	Stove and health condition monitoring.
Naryn	20	10 biomass stoves (KG1 and KG2) 10 coal stoves (KG4)	Stove and health monitoring. Before and after stove installation.
Chui	11	10 low pressure boilers (KG5) 1 coal stove (KG4)	Stove and health condition monitoring.

Traditional and new stoves comparison

Traditional solid fuel stoves are smoky due to a not completed fuel burning.
Providing conditions for full fuel combustion effects in no smoke.

Key features

- It is clean
- It saves fuel and improves comfort levels
- It is convenient: continuous operation

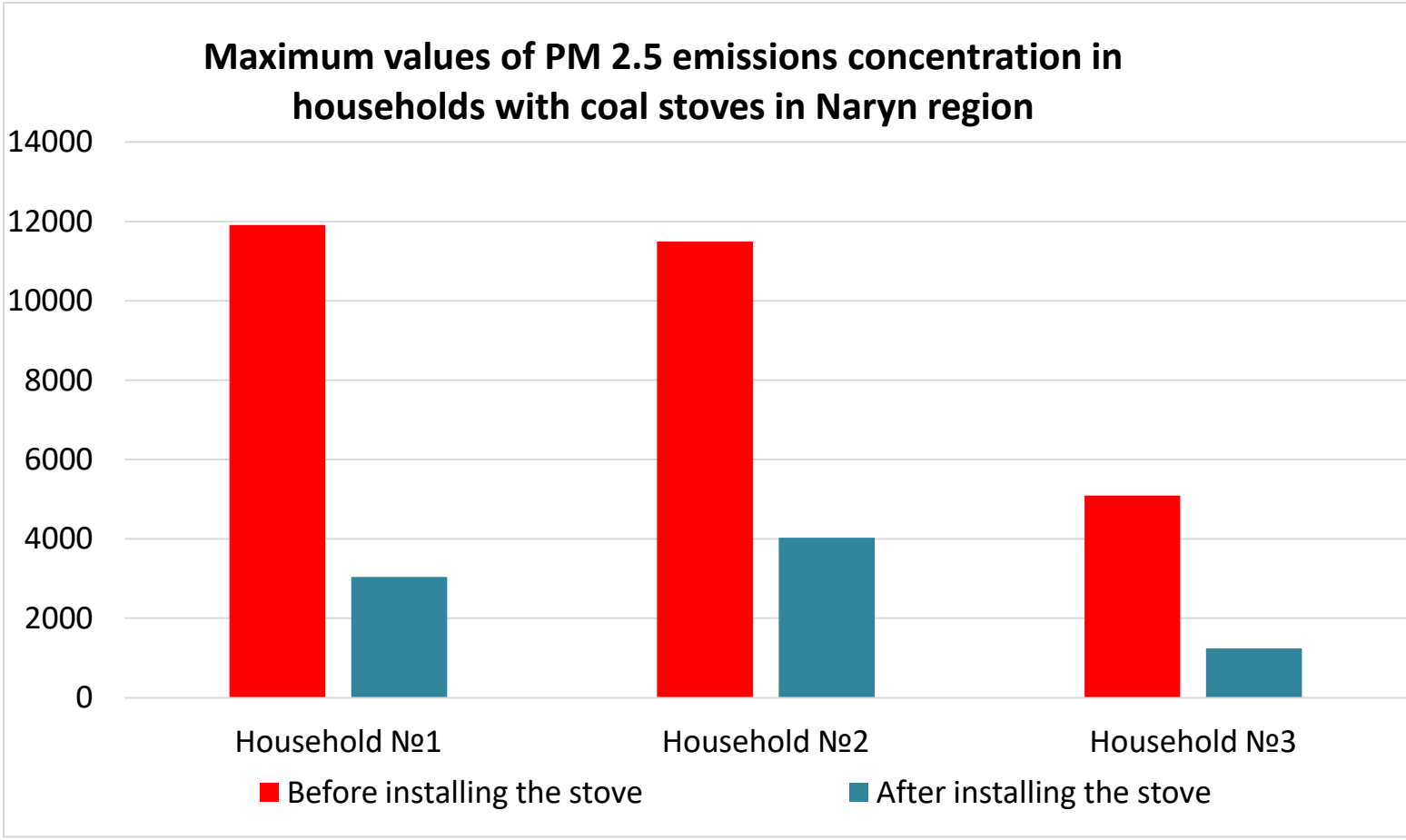


Measurement of CO concentration before and after installation of the new stoves

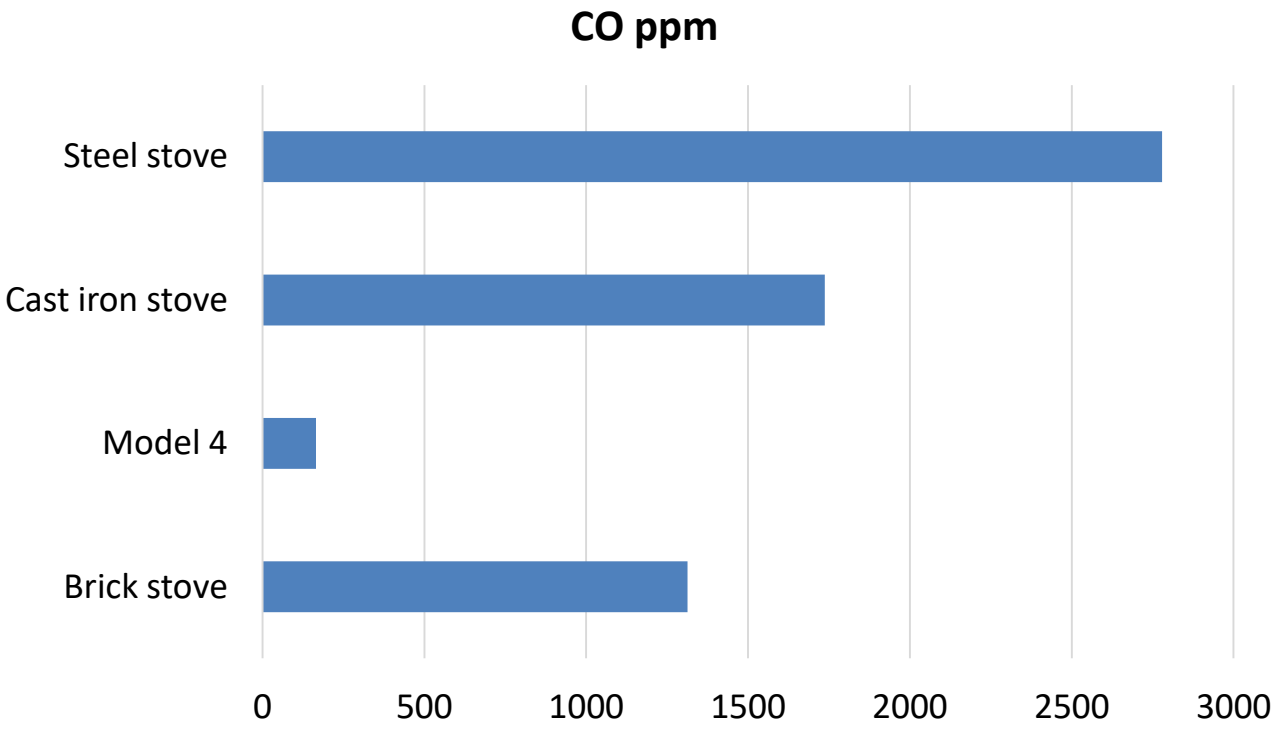
Traditional stove

New KG4 Stove

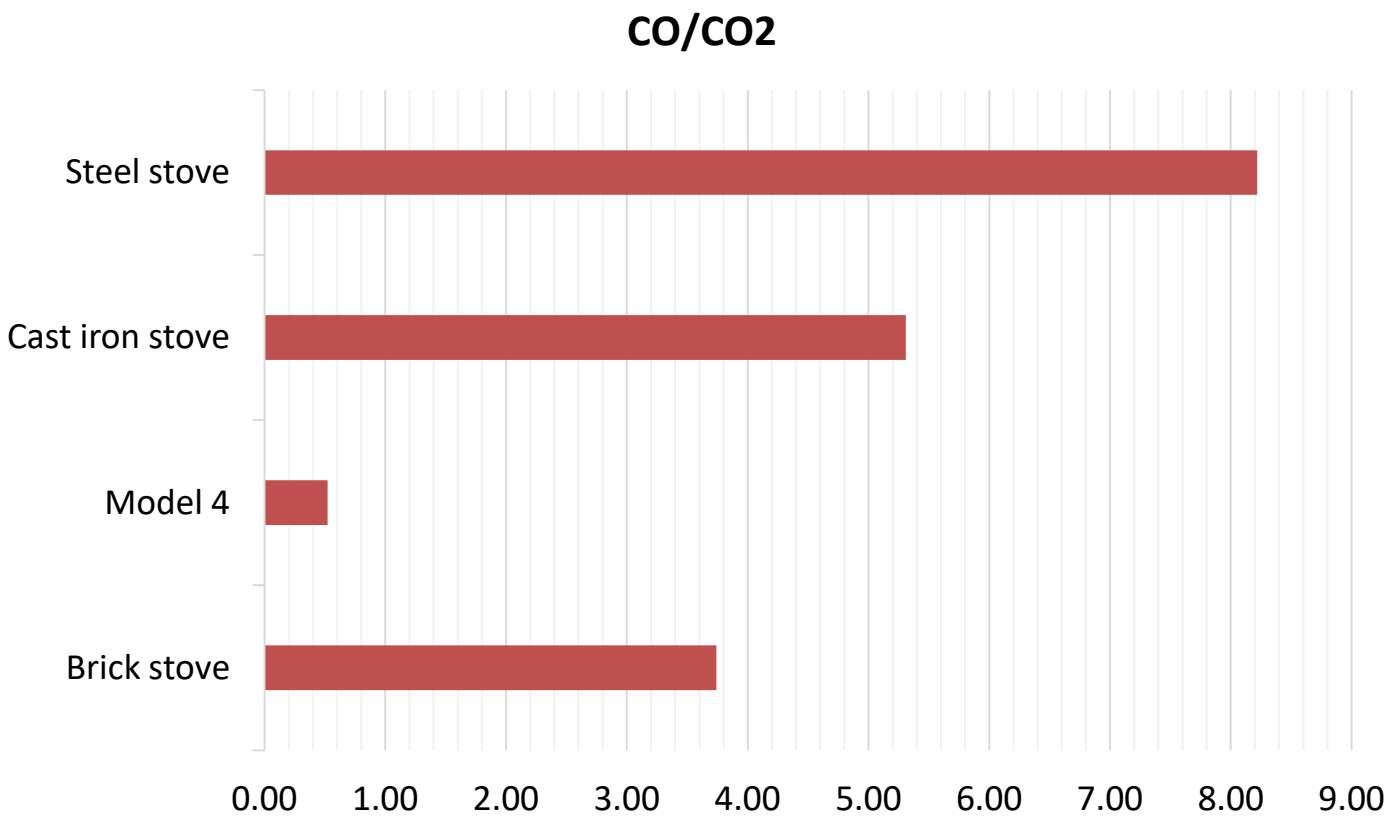
Indoor pollution comparison



Carbon monoxide (CO) outdoor emissions



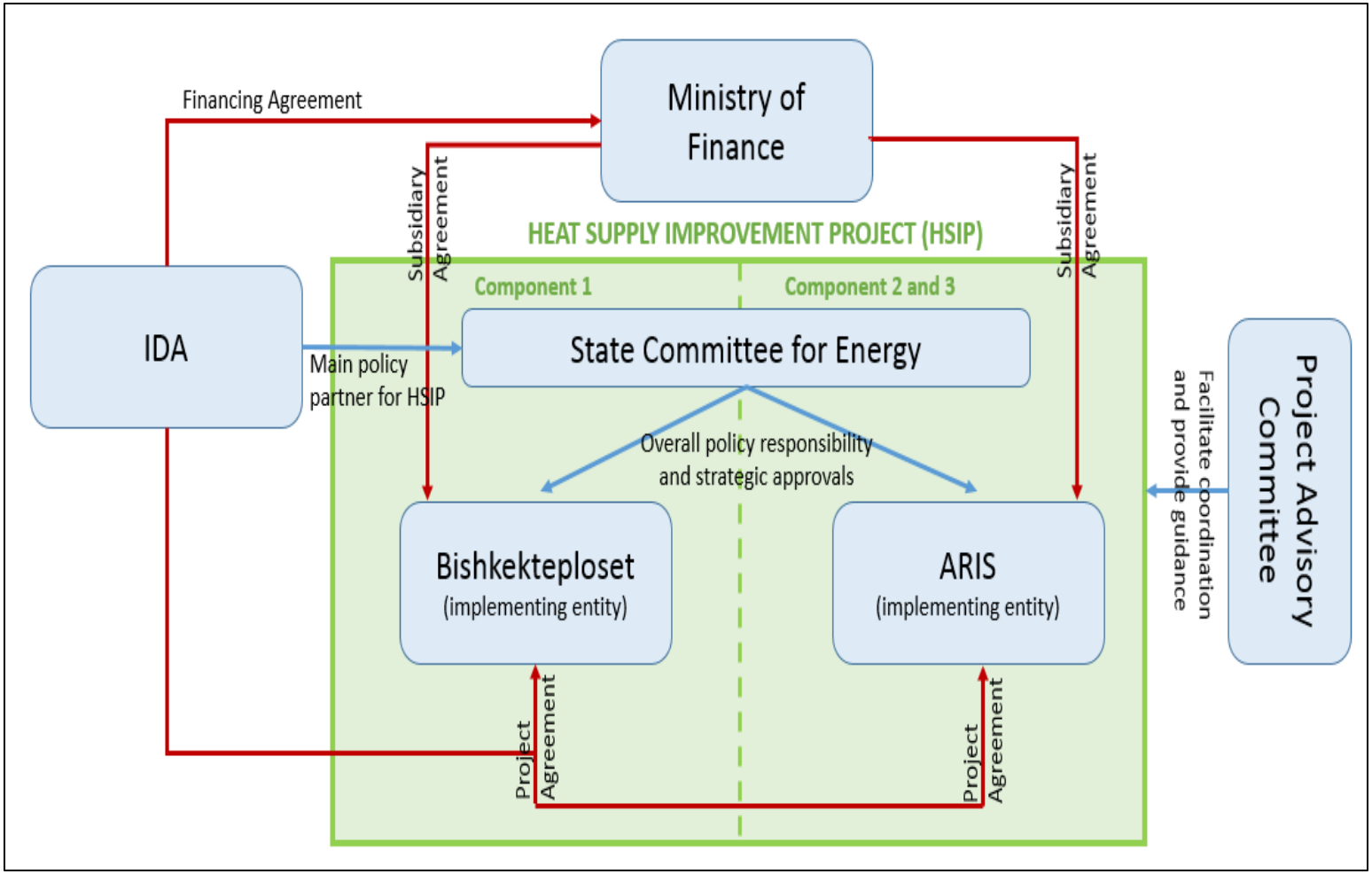
Combustion efficiency



CO/CO2 - : the system efficiency, expressed as the ratio of the energy delivered into the living space divided by the energy available from the fuel, and the combustion efficiency expressed as a completeness of the combustion of carbon.

Phase III: Scale-Up Program

Institutional Structure



Key Elements

- Household eligibility criteria
  - Poor households: social passport holders
  - Current solid fuel users
  - Reasonable housing condition without major heat losses
  - User agreement
- Product eligibility criteria
  - Technical performance (thermal efficiency, PM2.5, CO)
  - Safety and durability
- Supplier pre-qualification criteria
  - Legal entity
  - Participation agreement
  - Quality control, warranty, O&M manual, after-sale service
- Incentive mechanism

Implementation Arrangement