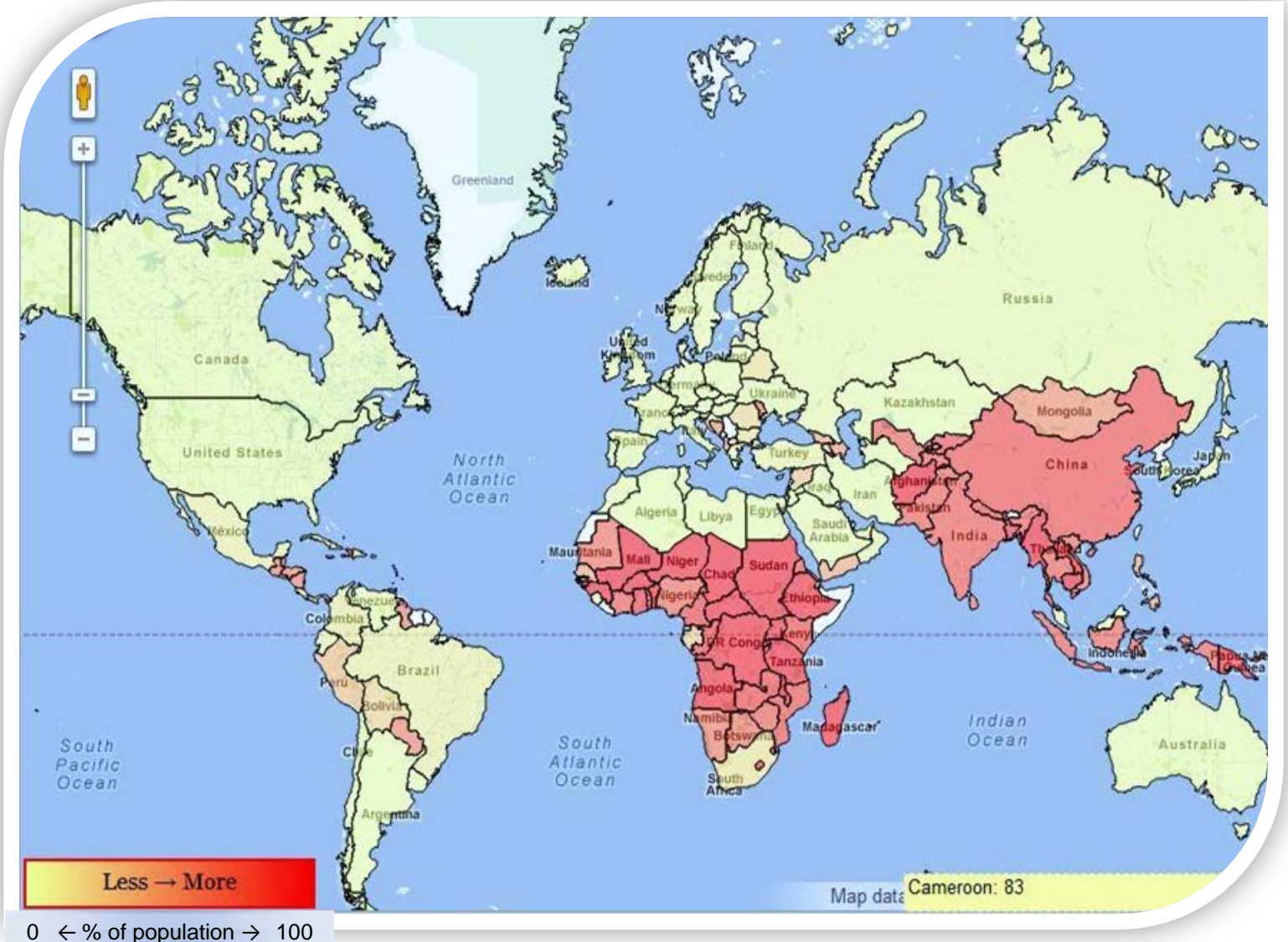
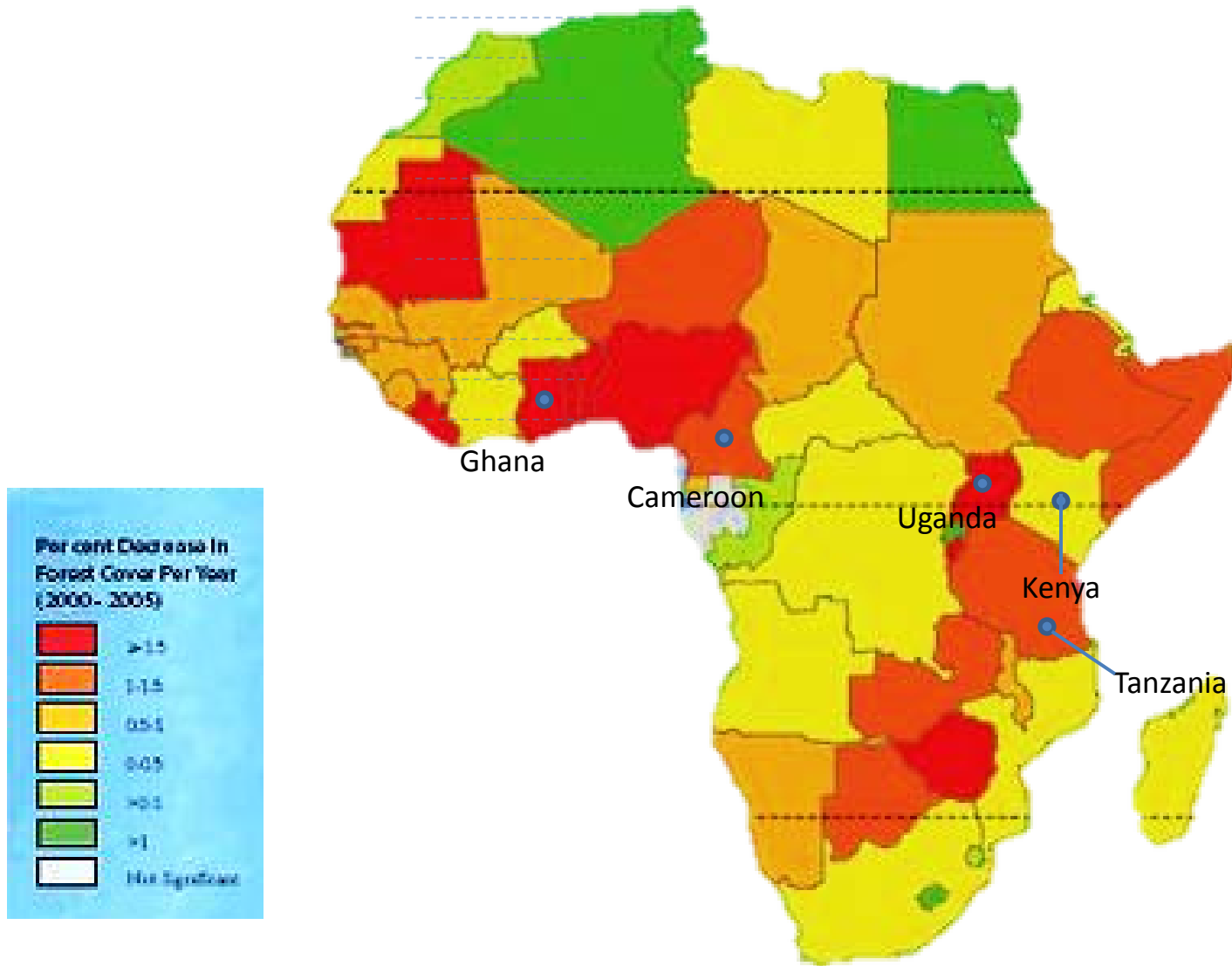


Potential for LPG Market Expansion
in Developing Countries
via Public-Private Partnerships
to Solve Major Global Mortality, Health,
Environmental and Labor-time Problems
Caused by Use of Solid Cooking Fuels

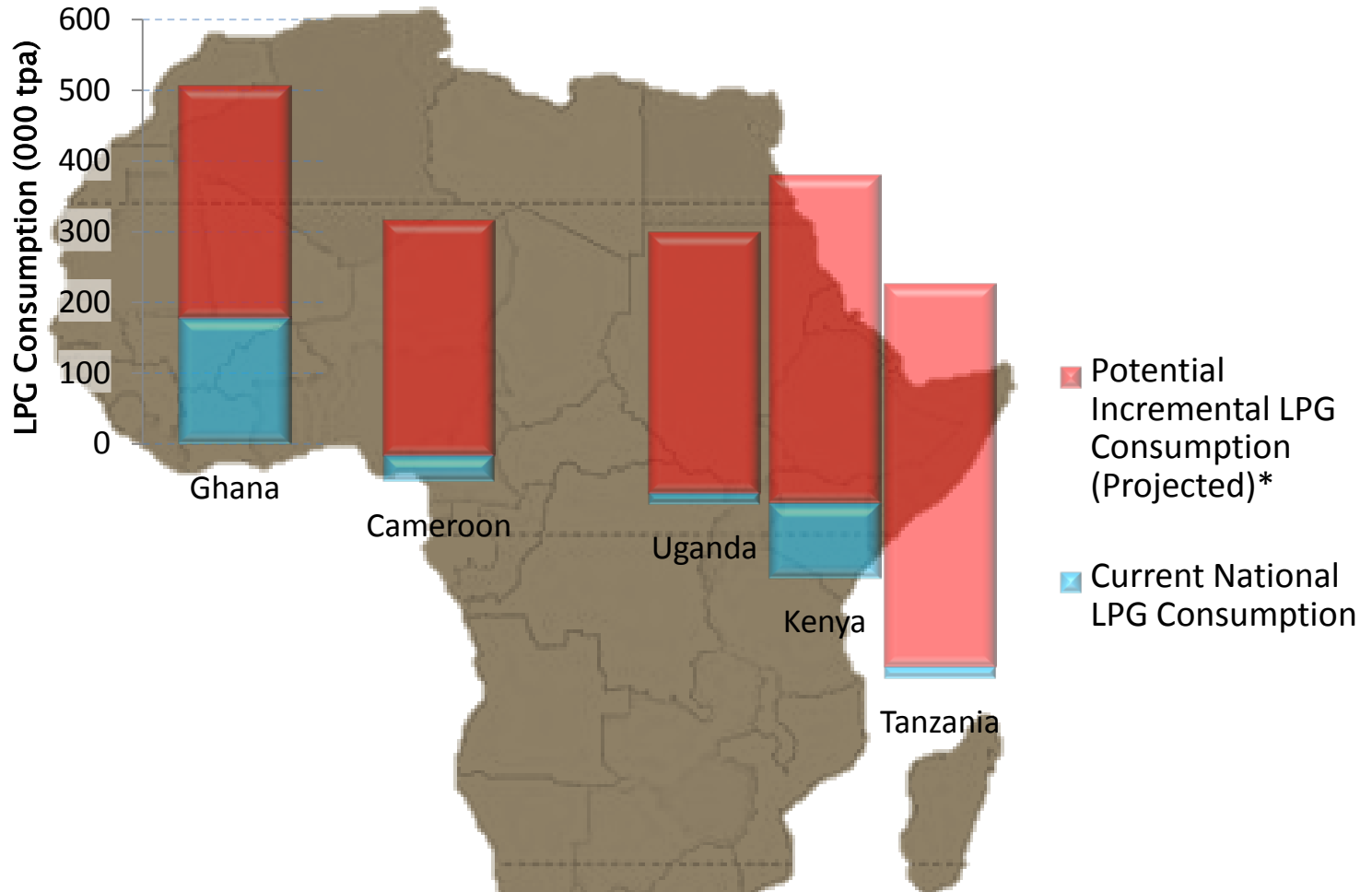
Use of Solid Fuels for Cooking



Deforestation in Sub-Saharan Africa



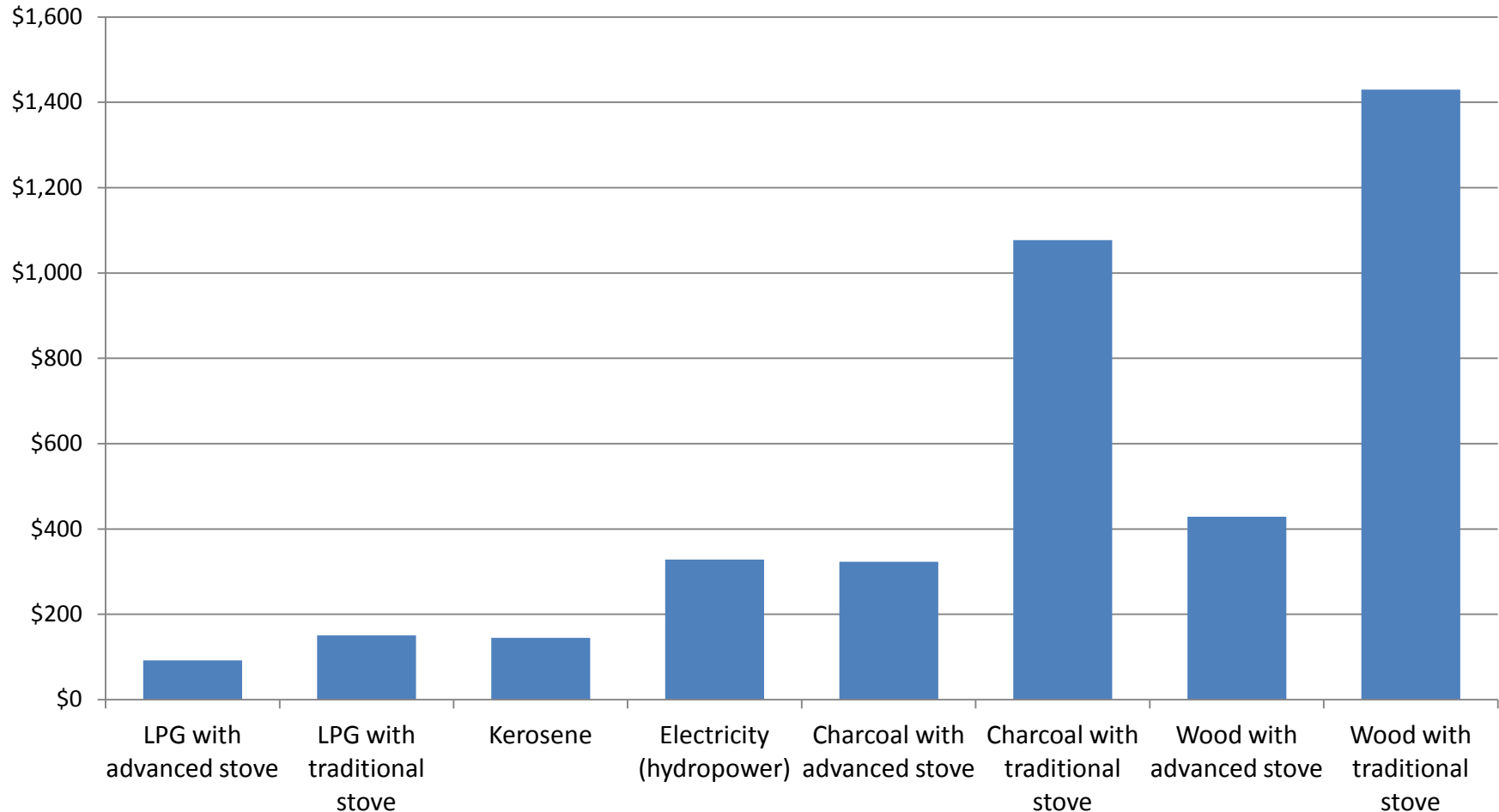
LPG Market Potential in Sub-Saharan Africa: 5 Target Countries



LPG consumption sources: Kenya: News Article: allafrica.com/stories/printable/201111160203.html, Nov. 2011; US EIA (2007) cites 2.45 k bbl/d = 77 ktpa; Uganda: Wana Energy Presentation to WLPGA Regional Summit, Nairobi, July 2011; US EIA (2007) cites 0.13 k bbl/d = 4 ktpa; Tanzania: Speech by Deputy Minister of Energy to WLPFA Regional Summit, Nairobi, July 2011; US EIA (2007) cites 0.22 k bbl/d = 7 ktpa; Ghana: Ghana Energy Commission, Cited in Kumasi Inst. of Tech. & Environment (KITE), Presentation for TEC LPG Seminar Series, Oct. 2011; US EIA (2007) cites 3.31 k bbl/d = 104 ktpa; Cameroon: News Article: allafrica.com/stories/201109060865.html, Sep. 2011; US EIA (2007) cites 1.53 k bbl/d = 48 ktpa; 3 Household LPG use per income quintile: World Bank Working Paper 5731, "Who Uses Bottled Gas", July 2011; Tanzania data from the online Nations Encyclopaedia (2001). Potential based on 70% urban / 25% non-urban penetration of LPG and 12 kg per month per capita cooking use (per capita data: World Bank 2011).

Household Economics of LPG Fuel

Comparative Costs of Cooking Fuels Annual Cost per Household - Cameroon



Source: Kosan Crisplant Cameroon, GTZ (Feb. 2012; electricity as of Mar. 2009)

LPG Market Development: Developing Country Accelerators and Barriers



- Growing incomes, middle classes
- Aspirational purchasing
- Urbanization
- Increasing cost / scarcity of substitute fuels
- Growing awareness of problems associated with “less modern” fuels
 - Illness / mortality
 - Deforestation
 - Others
- Mobilization of international capital, know-how



- Consumer first costs
- For BOP, high fuel cost as % of household income (increasingly applies to all fuels bought with cash)
- Lack of supply / infrastructure
- Theft of cylinders and other cheating
- Inconsistent safety practices
- Weak regulations and/or enforcement
- Corruption

Supply and demand: Which unlocks which?

LPG Transition Success Factors

Supply Chain

- Sufficient, rationalized infrastructure for reliable supply and low-cost distribution
- Realization of economies of scale
- Distribution / retail SME capability-building
- Access to capital

Consumer

- Financing of (or financial support for) consumer first costs
- Right range of cylinder sizes
- LPG stoves that fit the culture's pots
- Multidimensional consumer education

Government

- Adequate governmental policies and regulation: taxes/duties, safety, practices
- Adequate enforcement
- Market structure that
 - Incentivizes legitimate companies to invest in, and remain in, the market
 - Balances private sector profit requirements with goal of public/social benefit

Large-scale Transition Successes to Date

