

BerkeleyHaas

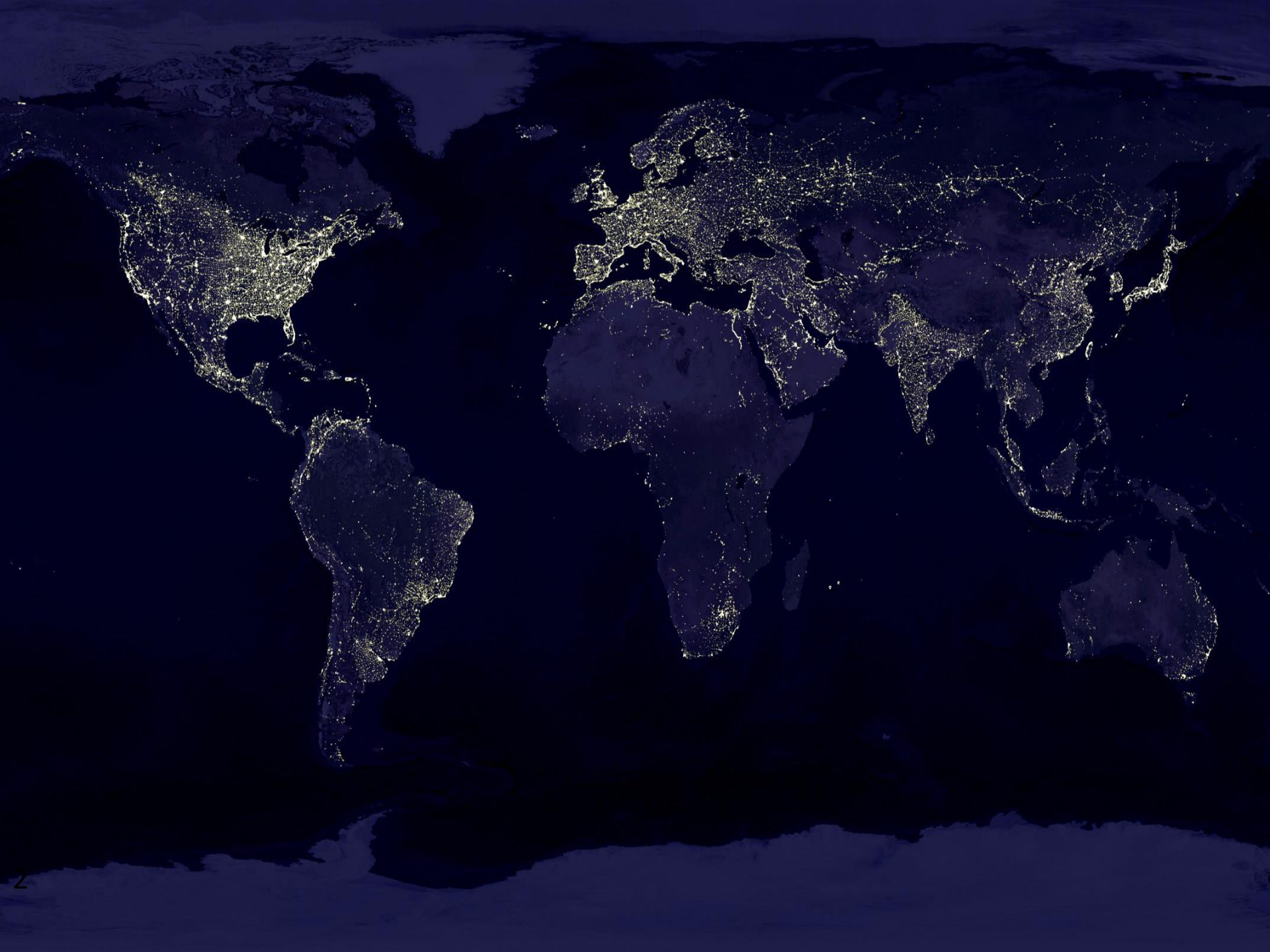
Haas School of Business
University of California Berkeley

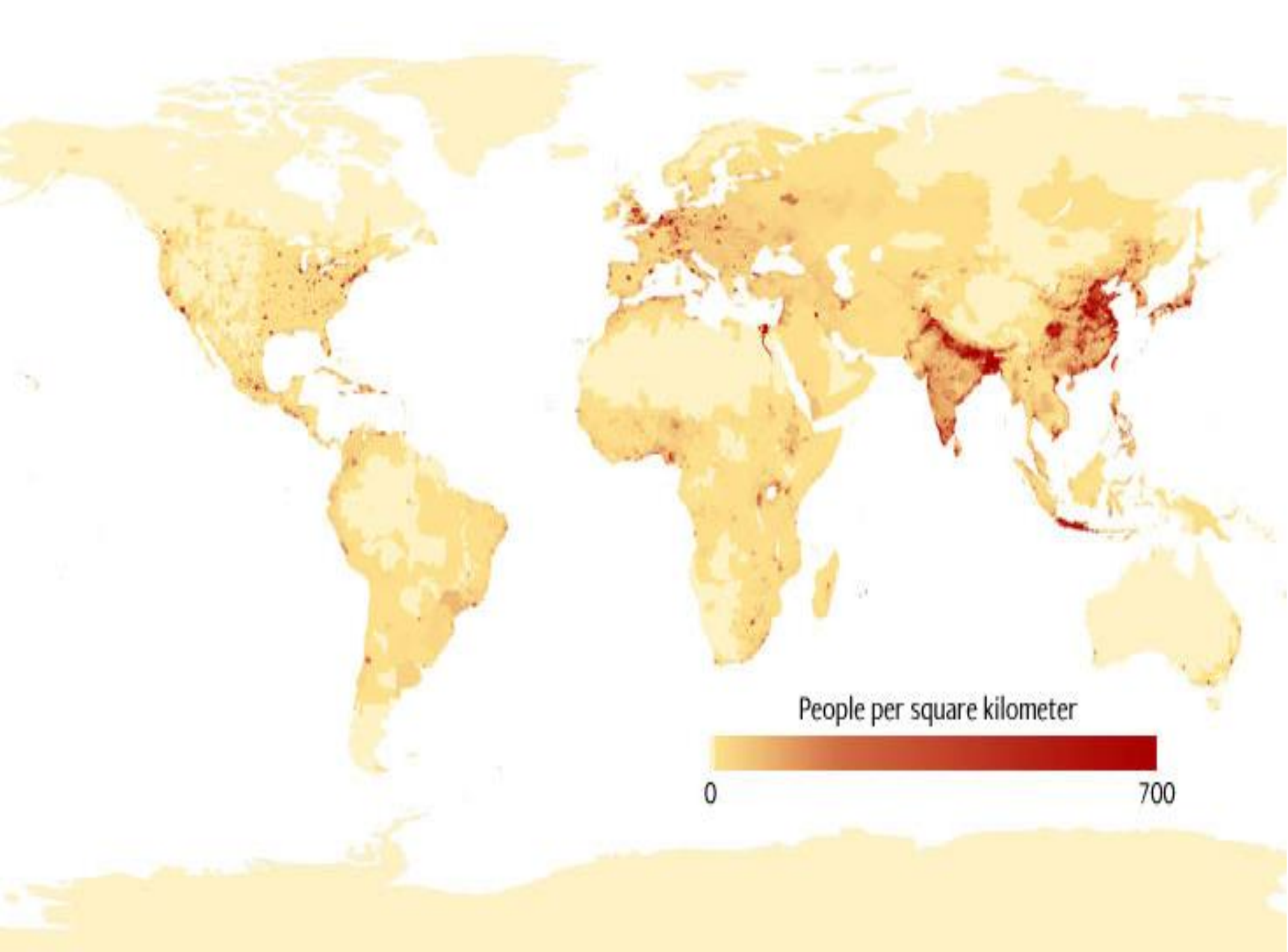


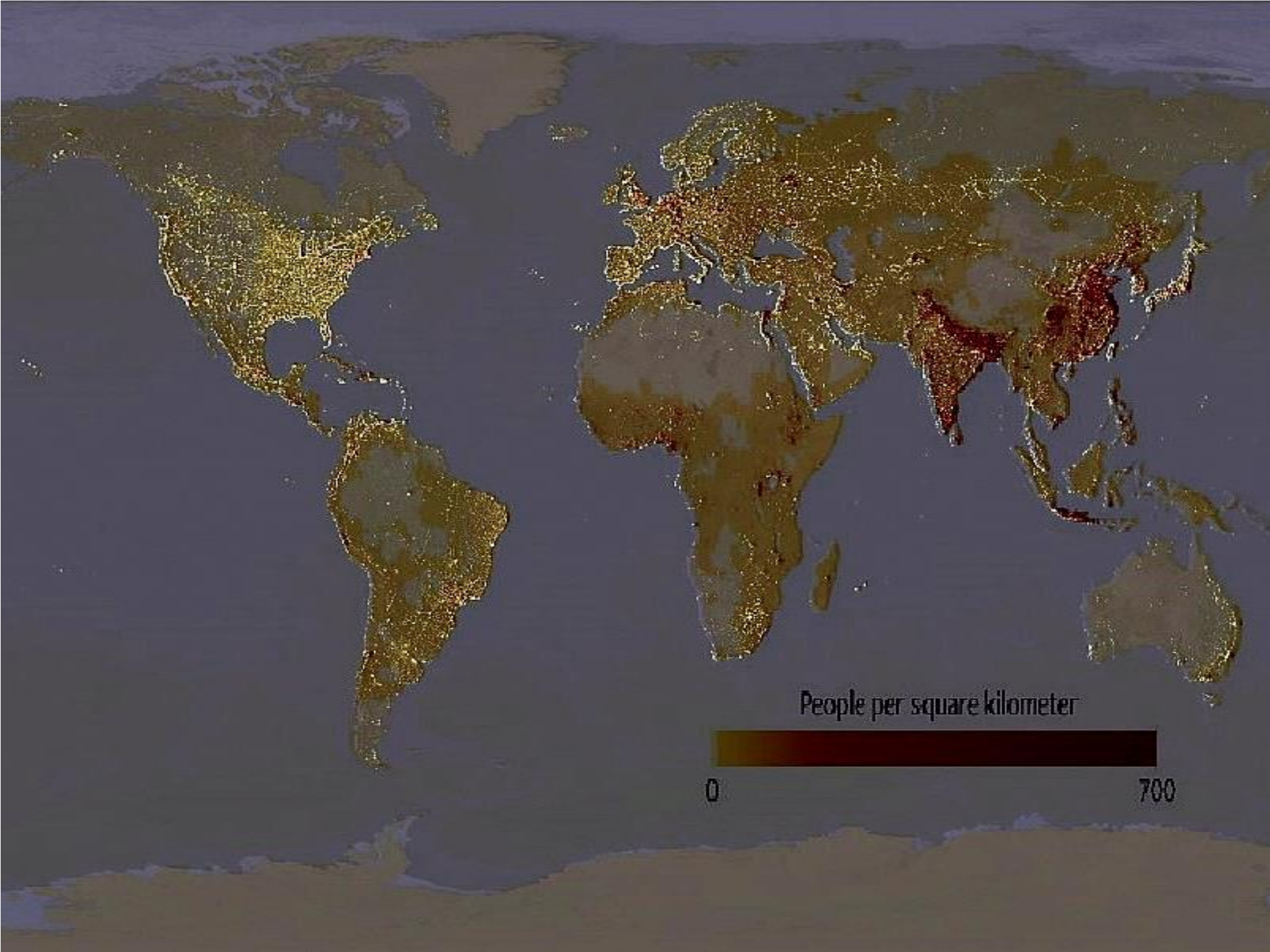
Energy in the Developing World: Perspectives from the Field

Professor Catherine Wolfram

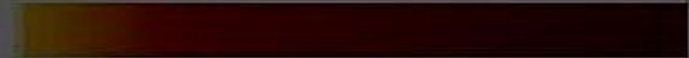
November 2017







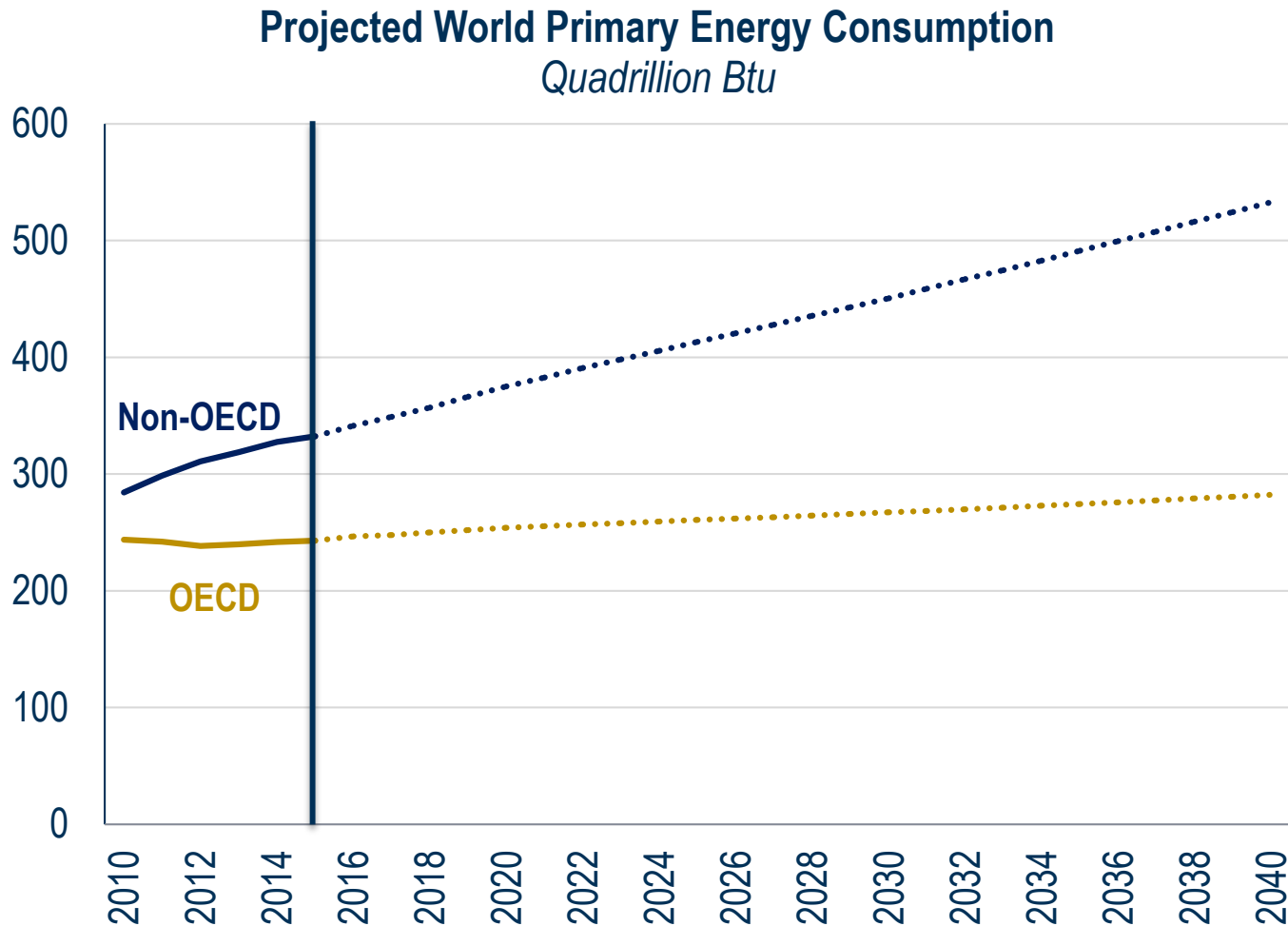
People per square kilometer



0

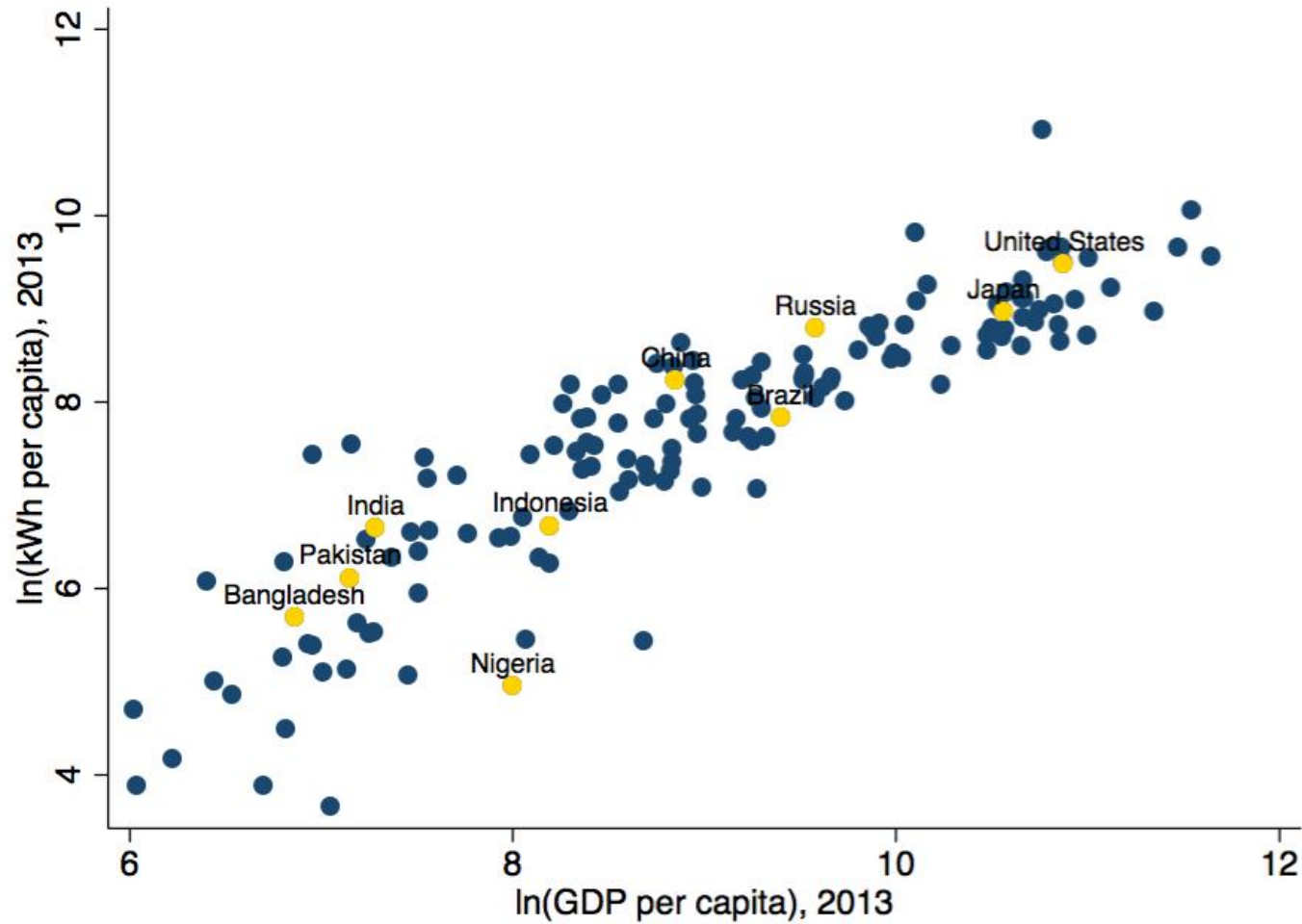
700

The developing world accounts for most expected growth in energy and CO₂ emissions



Source: Energy Information Administration International Energy Outlook, 2016

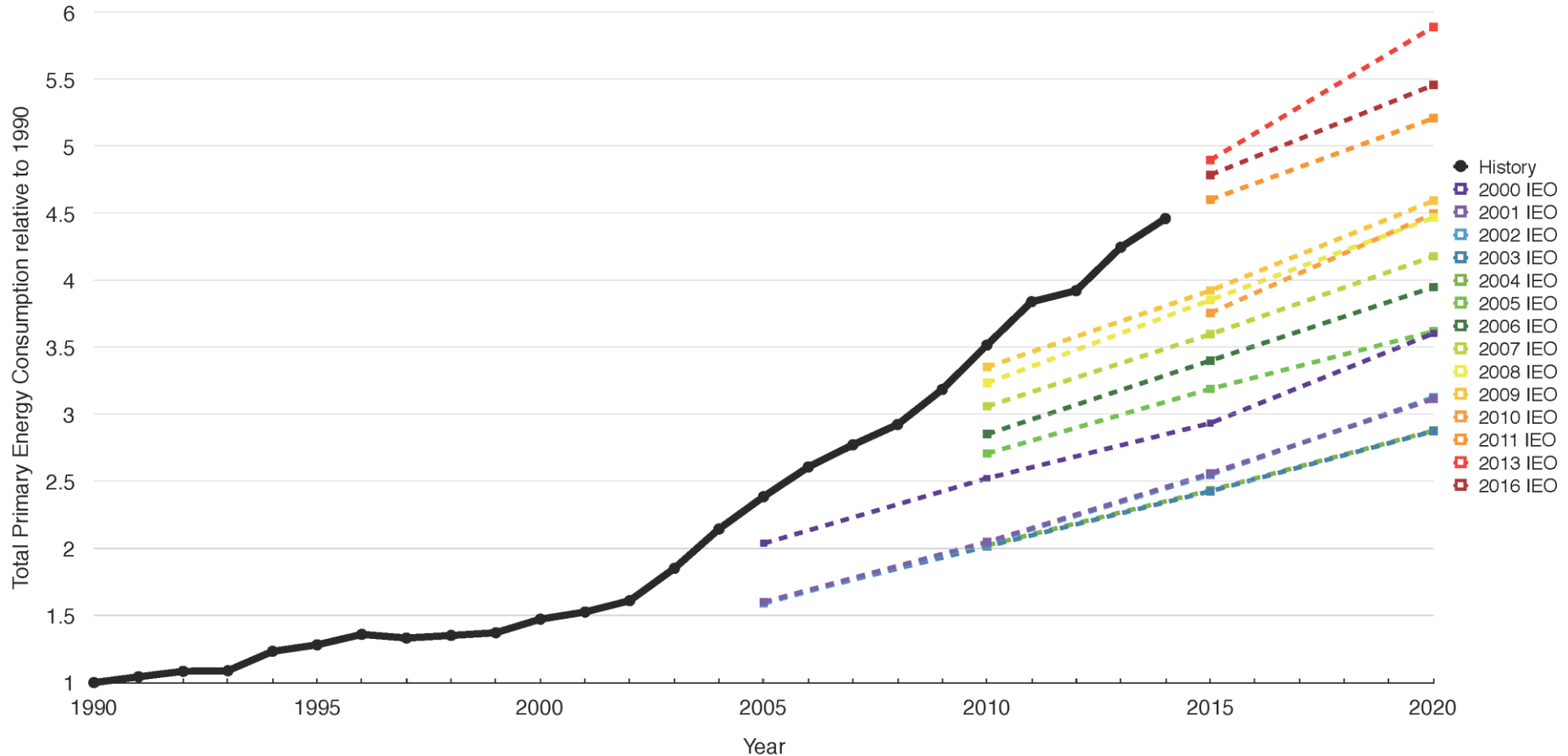
Energy correlated with economic growth



Source: World Bank, WDI

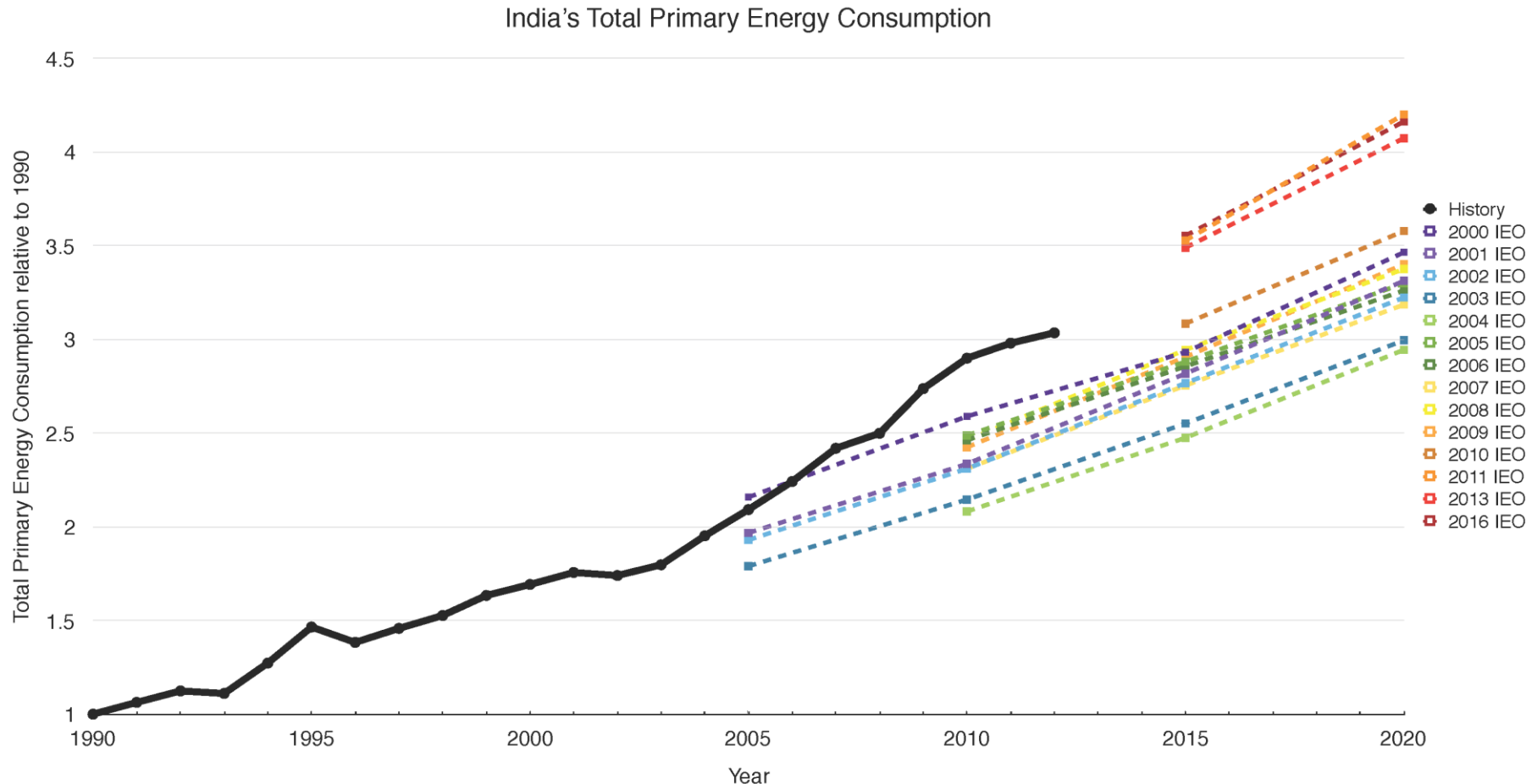
Previous projections underestimate energy demand in the developing world

China's Total Primary Energy Consumption



Source: U.S. Energy Information Administration

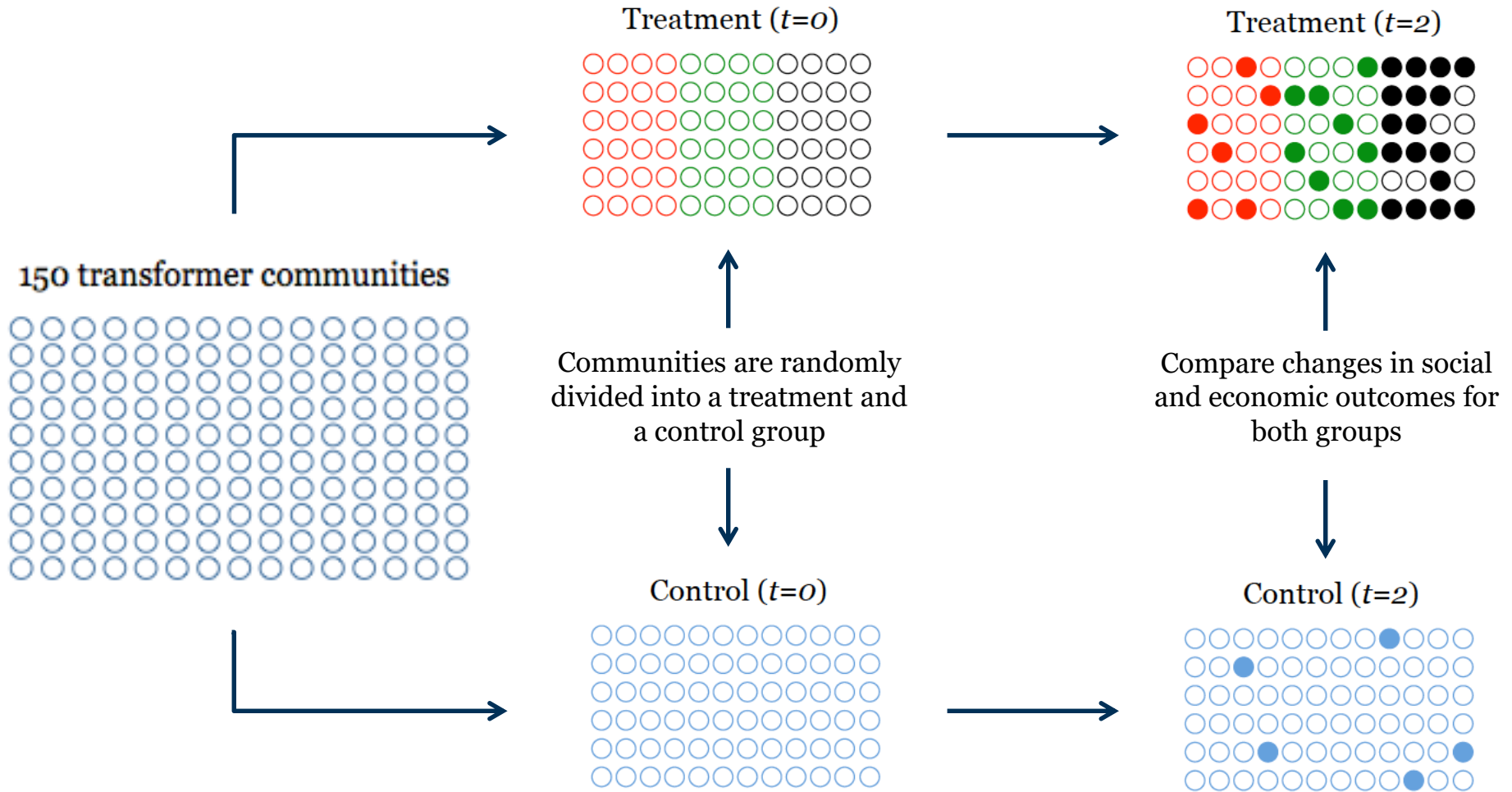
Previous projections underestimate energy demand in the developing world



Source: U.S. Energy Information Administration



Randomized controlled trial (RCT)



Step 1: Distribute “subsidies” to households

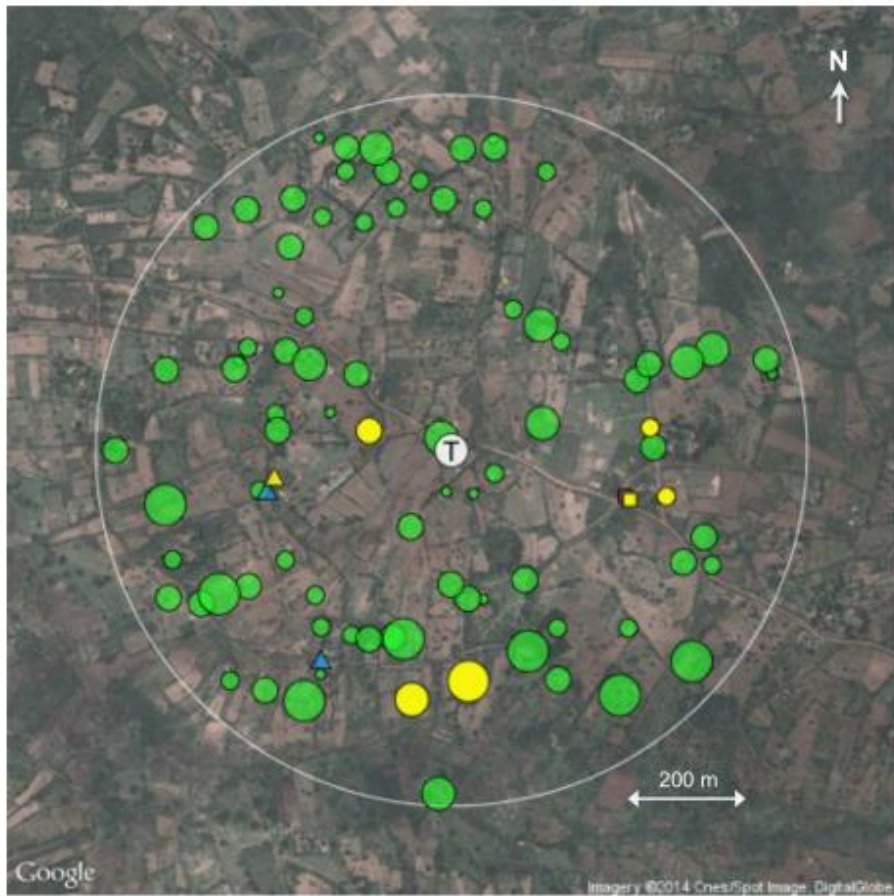


Step 2: REA extends national grid to households



Step 3: Kenya Power installs prepaid meters

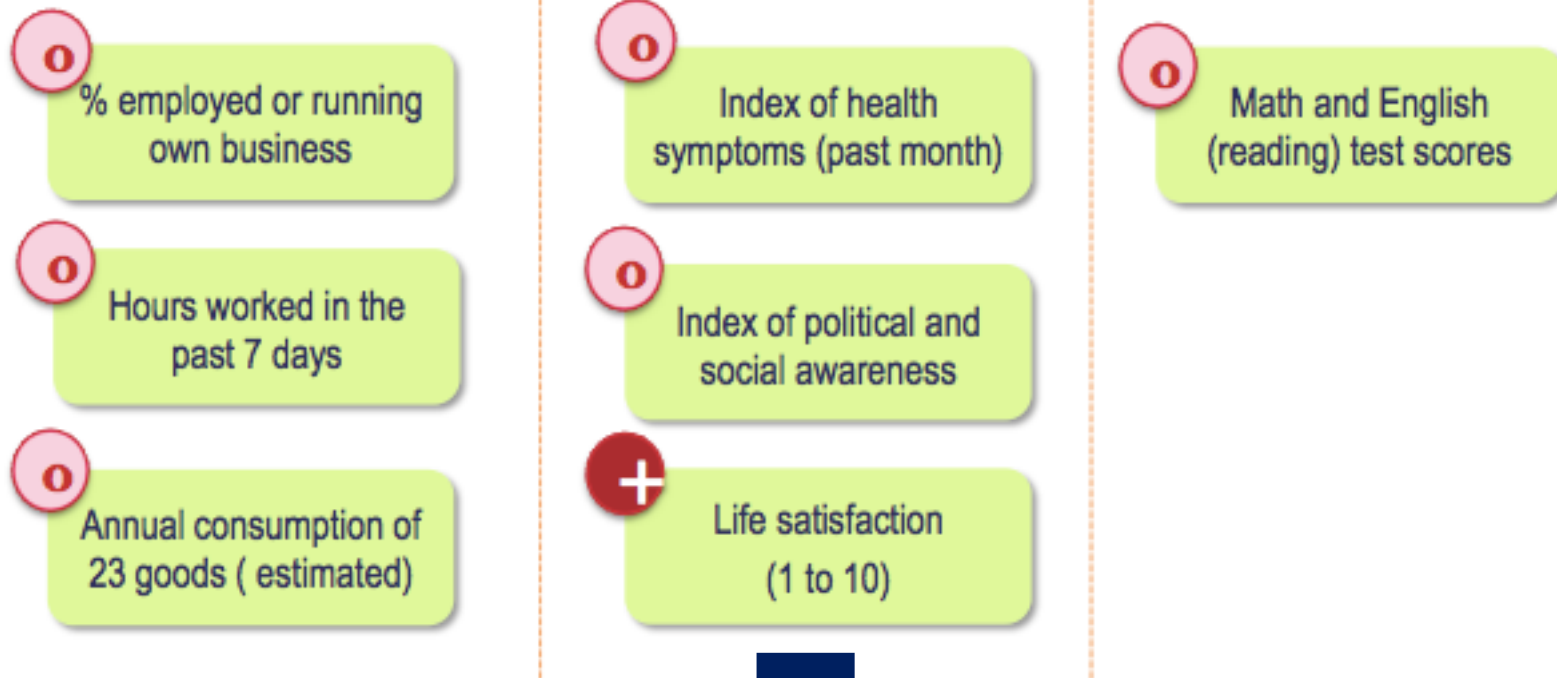




**Many households
are
“under-grid”**



**Households
want high
wattage
appliances**



Very small impacts of electrification

Are we too focused on rural electrification?



Most of the growth will come from commercial, industrial and existing on-grid households.

Are we too focused on rural electrification?



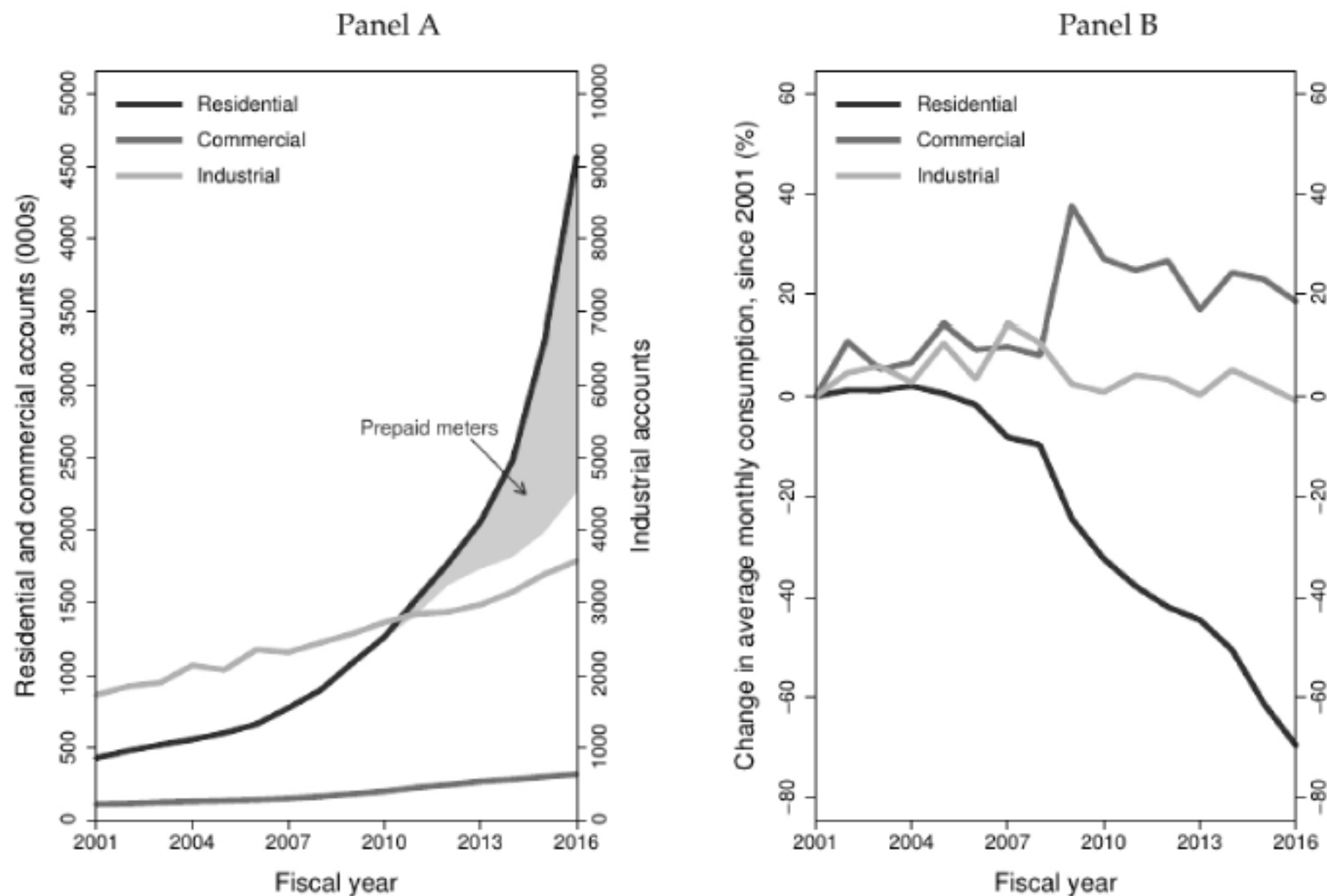
Households that lack electricity also lack other basic services.

Are we too focused on rural electrification?

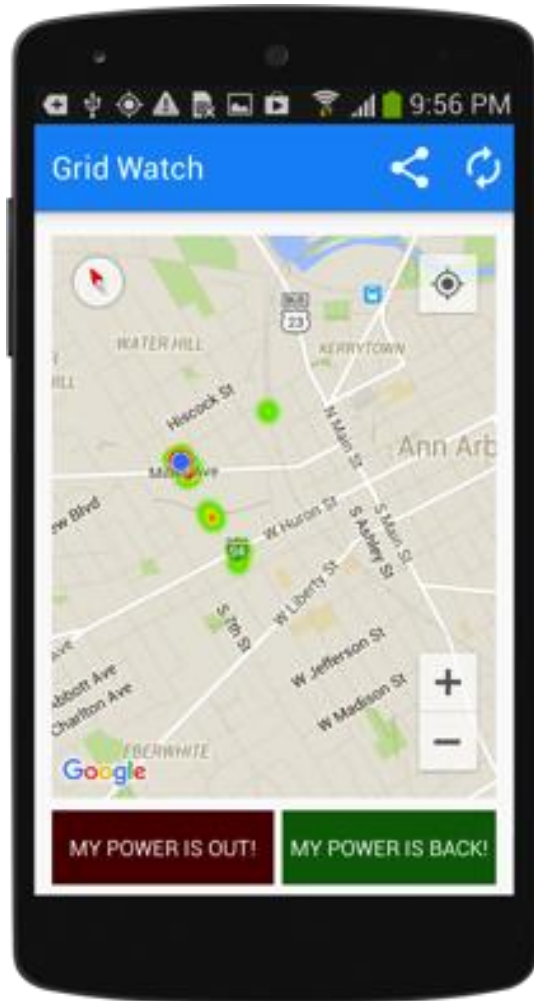


Rural electrification may divert resources from improving reliability on the existing grid.

Figure 1—Kenya Power electricity accounts and change in average consumption since 2001



We have a lot to learn about reliability.



GridWatch: A novel way to measure grid conditions.

Energy in the developing world

1

We need to **understand** the drivers of energy demand in the developing world,



Energy in the developing world

2

Develop both technological and policy solutions that work, and



Energy in the developing world

3 **Gauge** climate solutions based on impacts in China, India, and Sub-Saharan Africa.

