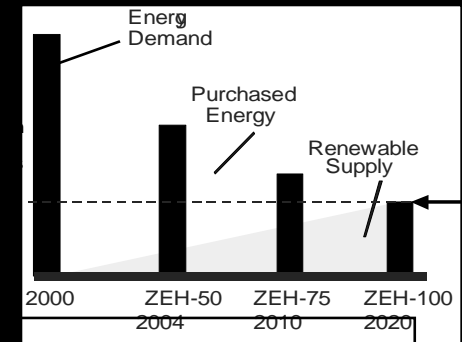




# Zero Energy Homes: What, Why, and How?



**Paul Norton**

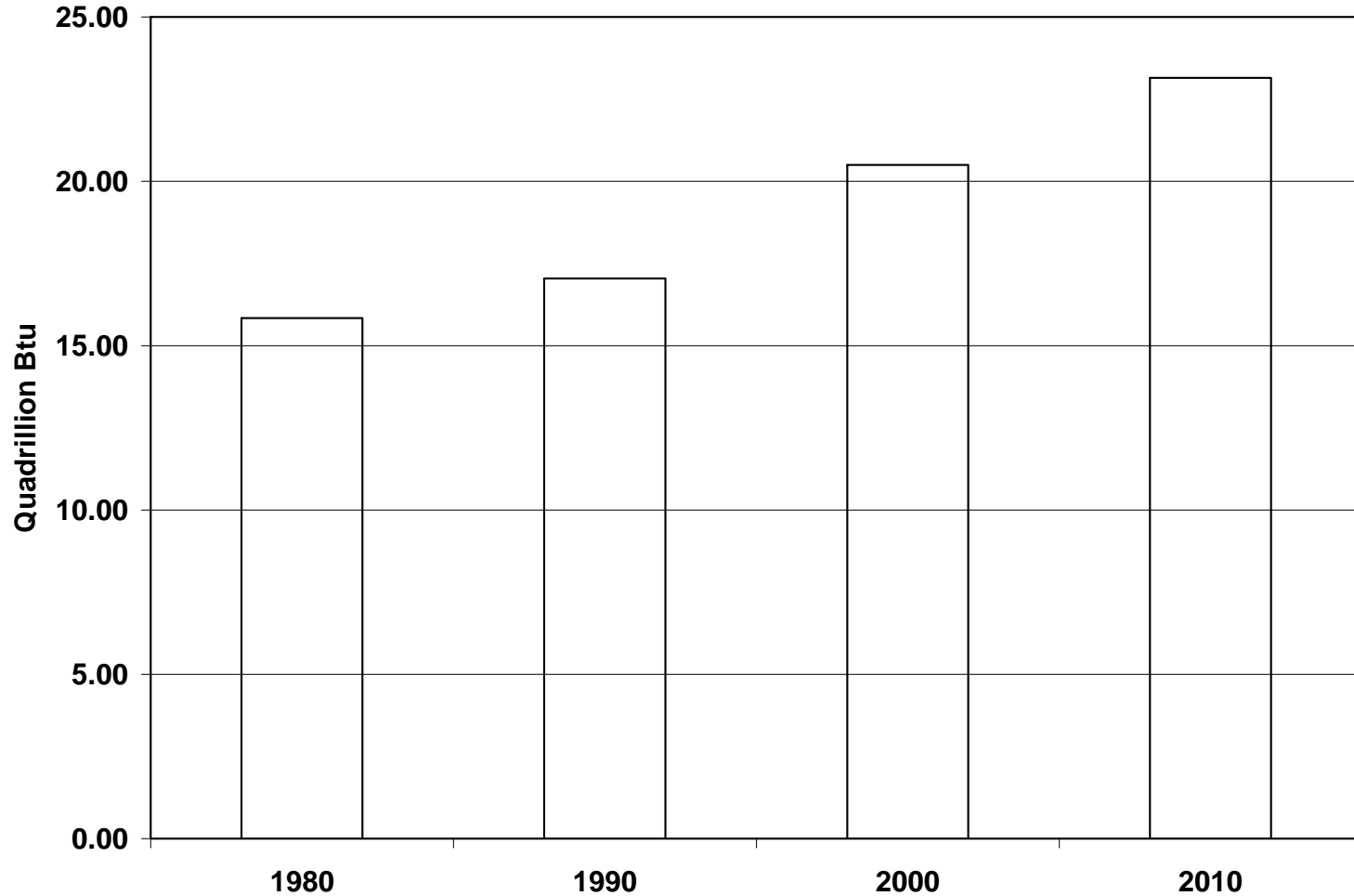
**Center for Buildings and Thermal System**

Why?

Homes account for **20%** of **all**  
US primary energy use

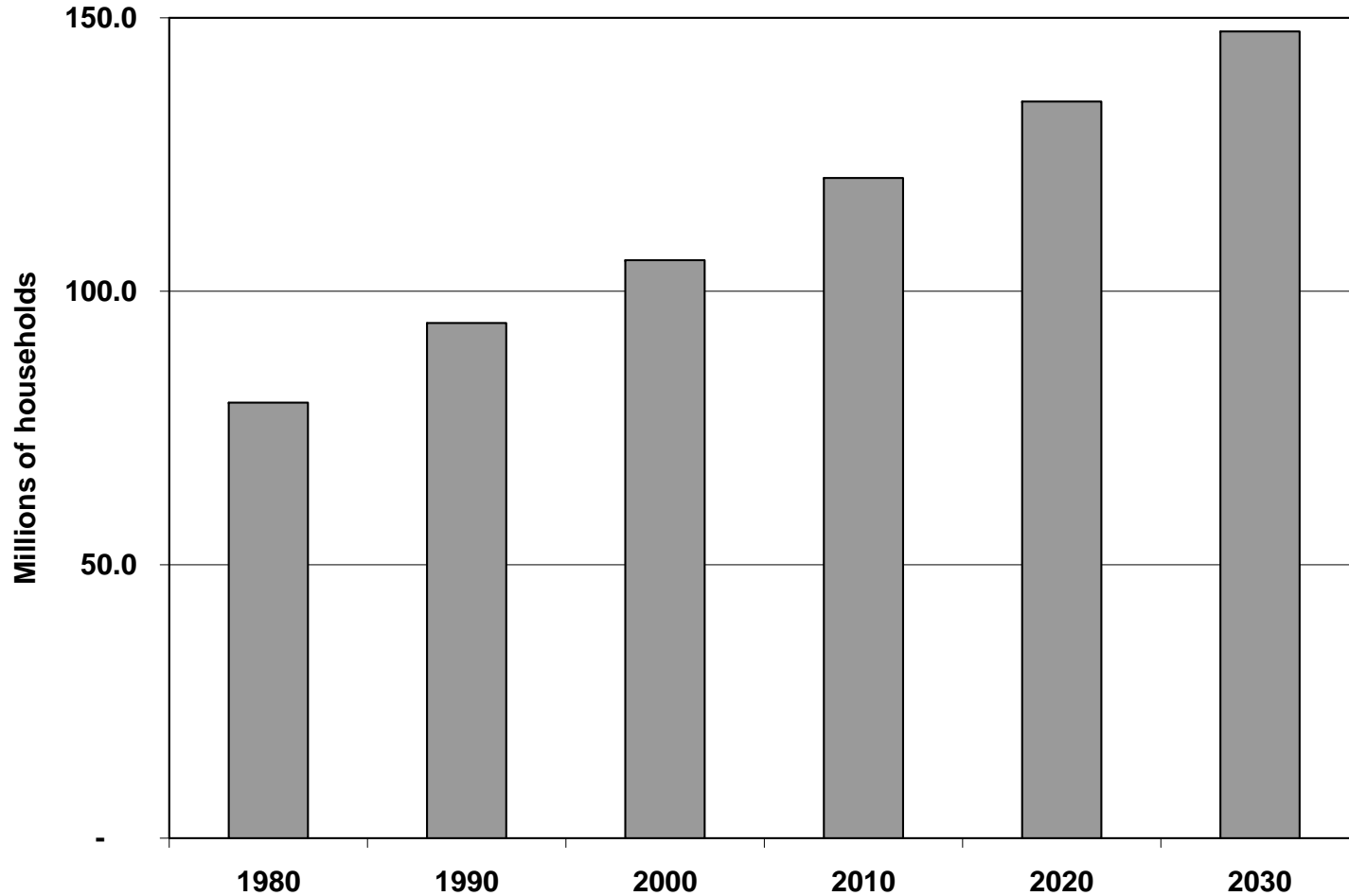
Homes account for **37%** of **all**  
US electricity use

# Residential energy use is growing



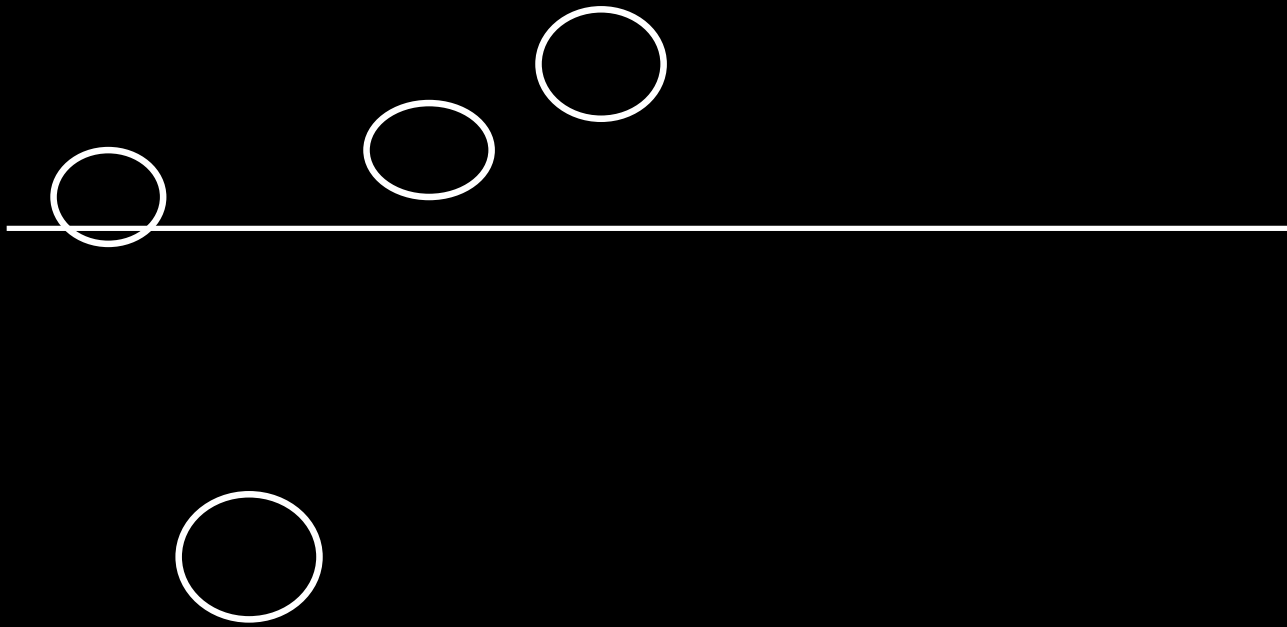
Residential  
primary energy  
consumption  
Source: DOE 2007

# Number of Households is Growing



Number of  
Households  
Source: DOE 2007





# What is a Zero Energy Home?

~~Zero Energy Homes  
consume NO energy!~~

# What is a Zero Energy Home?

**Zero Energy Homes  
produce as much energy  
as they consume  
on an annual basis.**

# What is a Zero Energy Home?

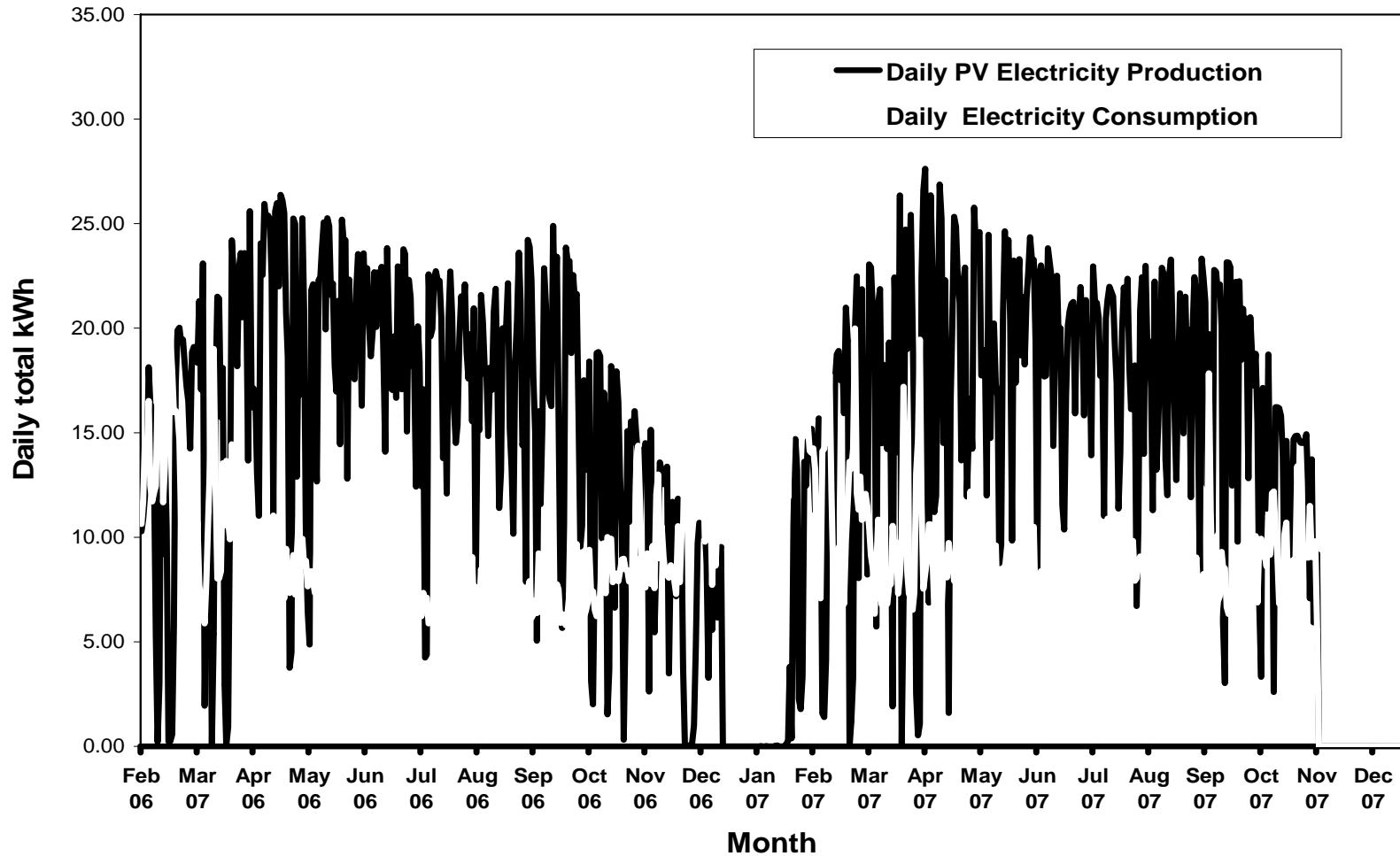
**Zero Energy Homes  
produce as much energy  
as they consume  
on an annual basis.**

- NET zero energy
- Zero energy  $\neq$  zero utility bills
- The path to zero in new homes
- How to make a zero energy home
- Examples of zero energy homes
- What about my existing home?

# NET Zero Energy: Daily Energy Flow

# NET Zero Energy: Daily Energy Flow

# NET Zero Energy: Seasonal Energy Flow



Zero energy  $\neq$  zero  
utility bills

Net metering

Net billing

Feed-in tariffs

# Feed-in Tariff

Some current feed in tariffs:

Germany

~ \$0.65/kWh

TVA

\$0.15/kWh

# The path to Zero Energy