

# Goading Architects into Sustainability: Two Bureaucracies

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Food, Agriculture + Human Impacts on the Environment



POWERLESS

電気がない

Via Flickr by Hamachi Hideya in Komagome



## Patients hospitalized for pneumonia on rise in quake-hit area

SENDAI, April 19, Kyodo

### 282 deaths linked to aftermath / Unsanitary conditions, cold temperatures blamed for postdisaster toll

The Yomiuri Shimbun

Among people who survived the March 11 massive quake and tsunami but died later in the month in the disaster-stricken Tohoku region, at least 282 were believed to have succumbed to postdisaster-linked factors, such as cold temperatures and unsanitary conditions at evacuation sites that aggravated their chronic illnesses, The Yomiuri Shimbun has learned.

## 'Invisible' deaths continue at evacuation shelters

🕒 April 19, 2011

🐦 Tweet 0

👍 Like

With the help of her son, 84-year-old Sai Ito survived the March 11 earthquake and tsunami that swamped their hometown of Otsuchi, Iwate Prefecture.

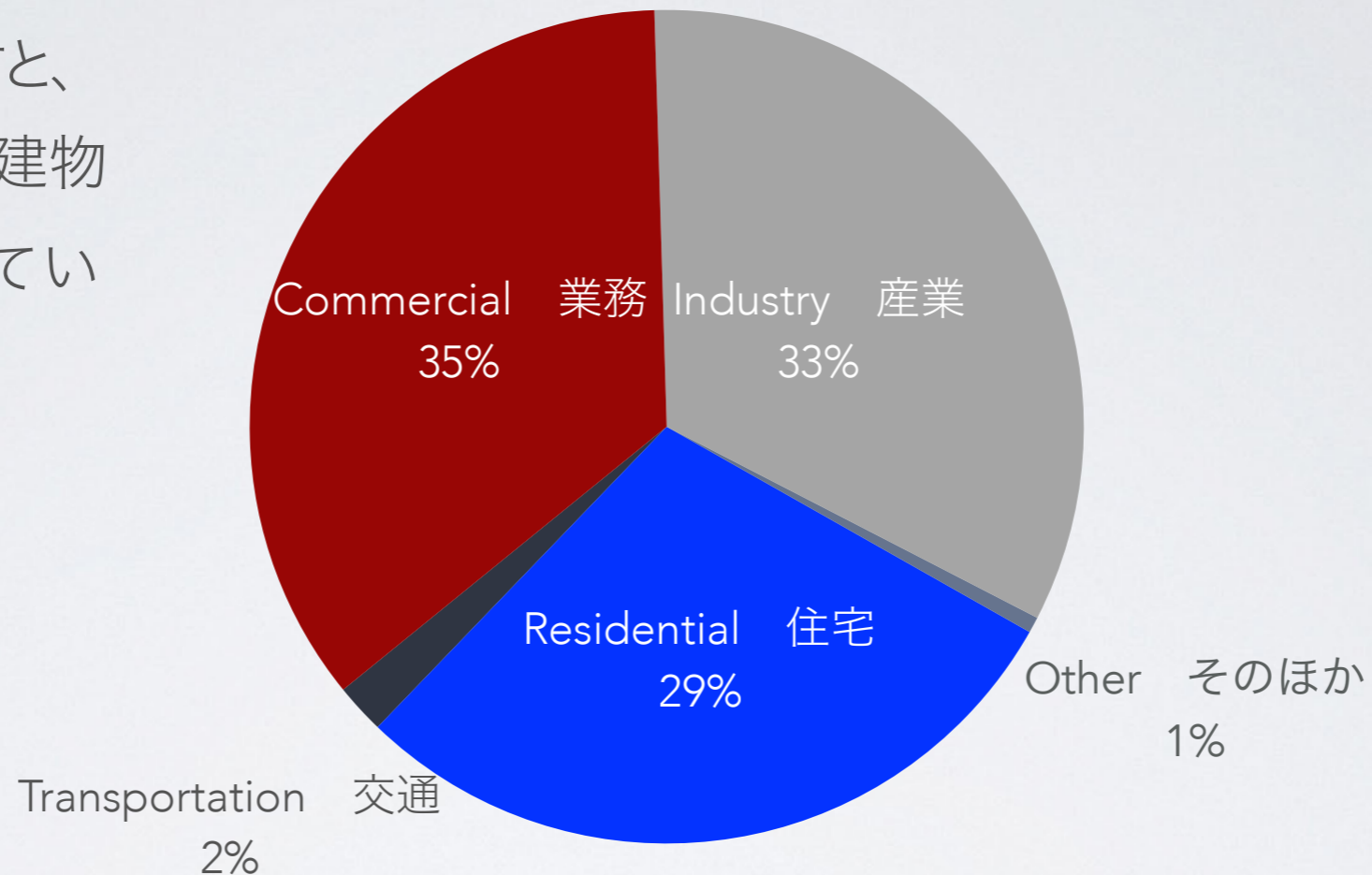
Amid the frigid temperature, the son, Akira, 60, and neighbors carried the elderly woman up a mountain, where she was air-lifted by helicopter the following afternoon to a nursing home.



# ELECTRICAL CONSUMPTION BY SECTOR, JAPAN (2015)

部門別電力消費量 (2105年)

電気ですと、  
6+割が建物  
で使ってい  
る。



iea.org

Japanese architecture is the country's biggest user of electricity. That ratio is normative.





ORNAMENTAL  
ILLUMINATION

LARGE AREAS OF  
GLASS OFFER  
LIMITED THERMAL  
RESISTANCE

LIMITED USE OF  
DAYLIGHTING  
FOR INTERIOR  
ILLUMINATION



## Challenges to the AEC community in Japan:

- **Resistance.** Changes affect stylistic approaches.
- **Conflict** with Olympics demand (also 2020).
- **Lack** of scientific + technical (simulation) knowledge.
- **Small fees:**
  - If mechanical/energy design not required or limited, architect can capture the moneys
  - If they are needed, construction companies offer quick + dirty solutions cheaply

Many good tools are not products.

省エネの場合には  
沢山の良い方法は物や製品ではありません。



BEMS  
Fuel Cells  
BIPV  
Cool equipment

Higher value-added;  
easy to export.

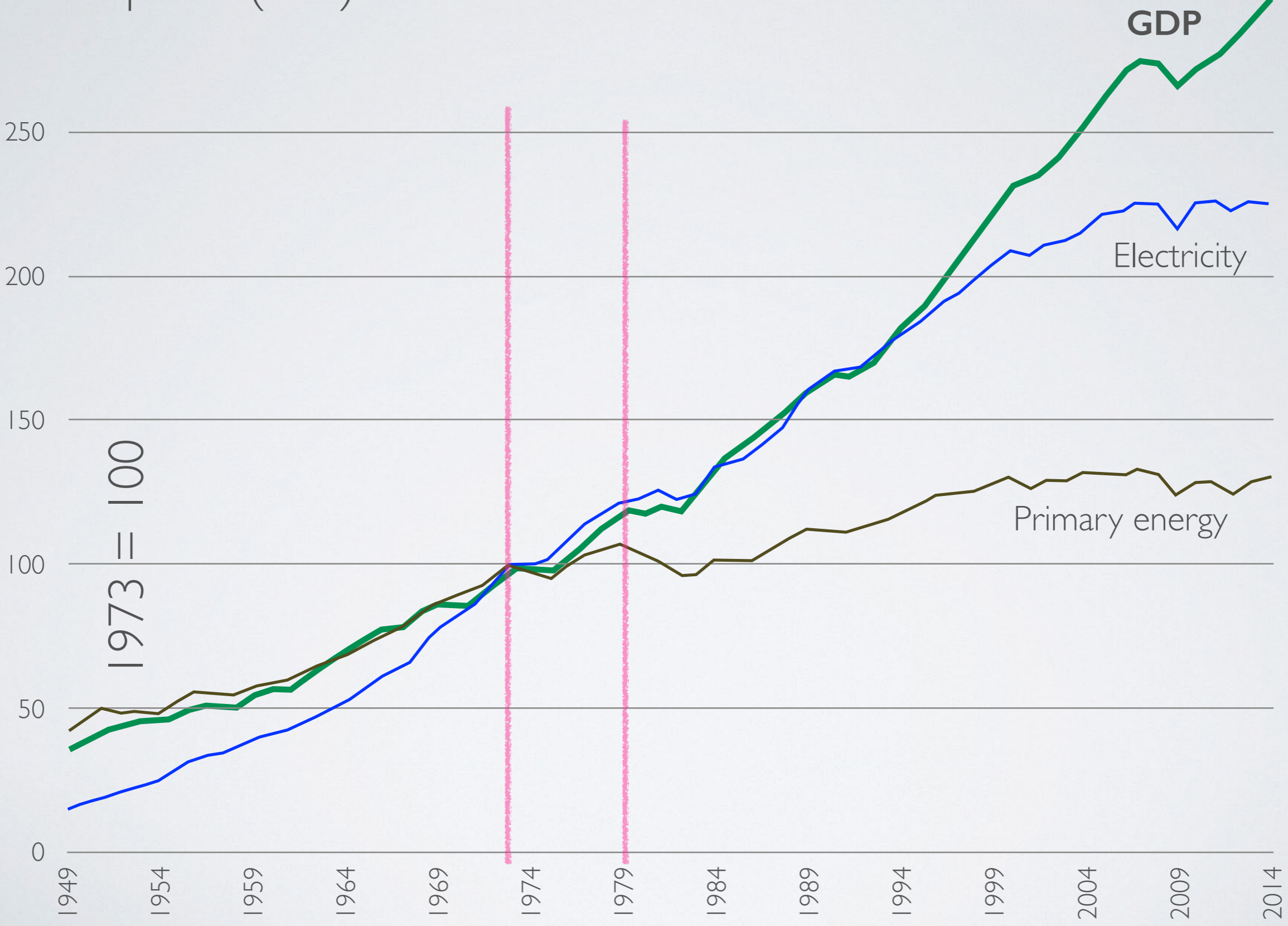
輸出し易くて、高付  
加価値製品になる。

\* Voluntary until 2017.





GDP growth has **decoupled** from energy or electricity consumption. (U.S.)



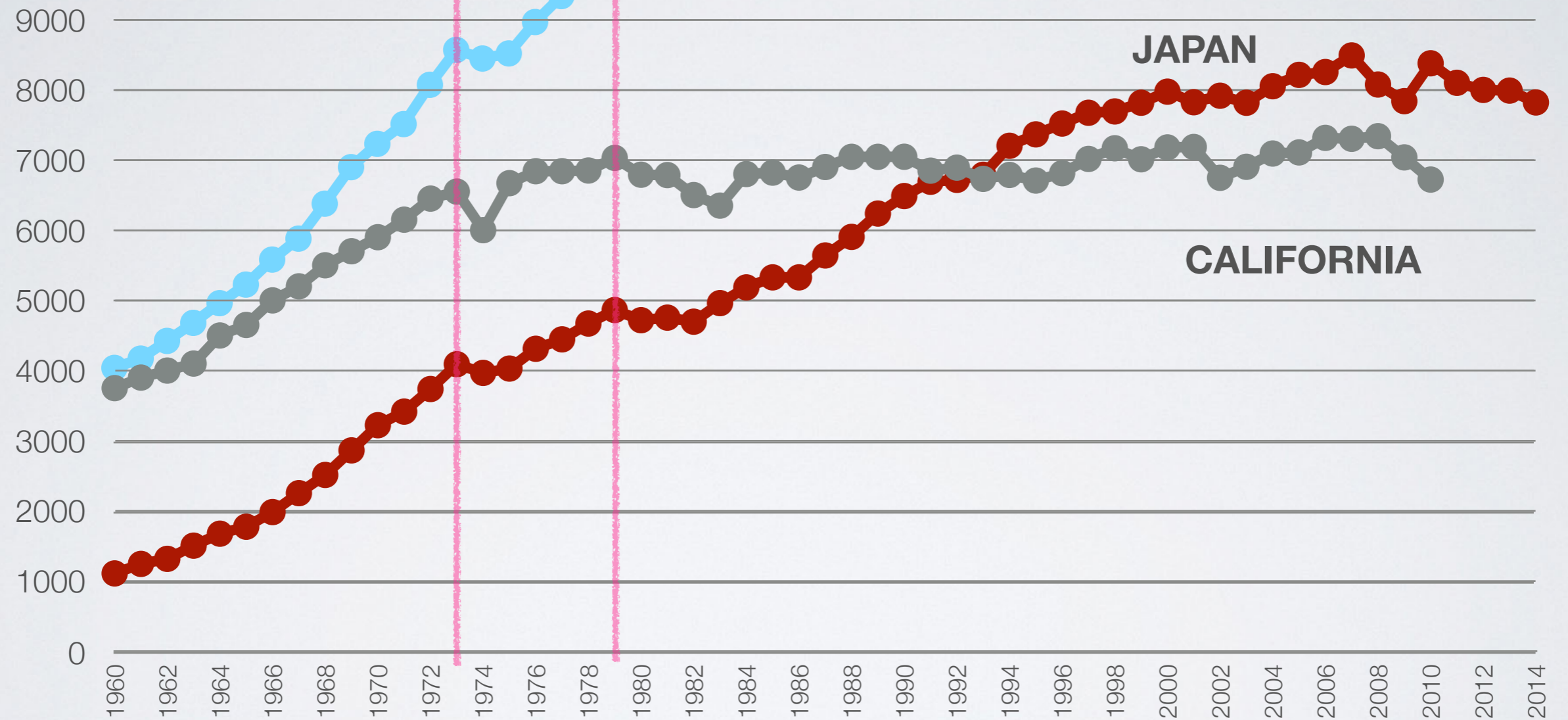
“Electricity Consumption and Economic Growth: A New Relationship with Significant Consequences?” by Richard F. Hirsh + Jonathan G. Koomey



# Electric power consumption

per capita 一人あたり電力消費

kWh per capita





## DECREASES POLLUTION

Avoided **30 LARGE POWER PLANTS** since 1970s; 11 more would have been needed over the next decade.



## SPURS ECONOMIC INNOVATION

Efficiency-related jobs grew 15% — other job growth was ~2% (2002-12).



## CUTS ENERGY WASTE

**1/5 OF STATE ELECTRICITY NEED MET THRU SAVINGS**



## HELPS MEET CLIMATE GOALS

Slashed **30M METRIC TONS OF CO<sub>2</sub>** 2003-15. Cuts one of the largest sources of CA's greenhouse gas emissions.

## SAVES CALIFORNIANS MONEY

Research yielded \$46 for every \$1 invested.

Codes + standards saved **\$75 BILLION** since the 1970s.

Newest bldg. codes save \$6K/house.



**BENEFITS FROM CA'S INVESTMENT IN EFFICIENCY**



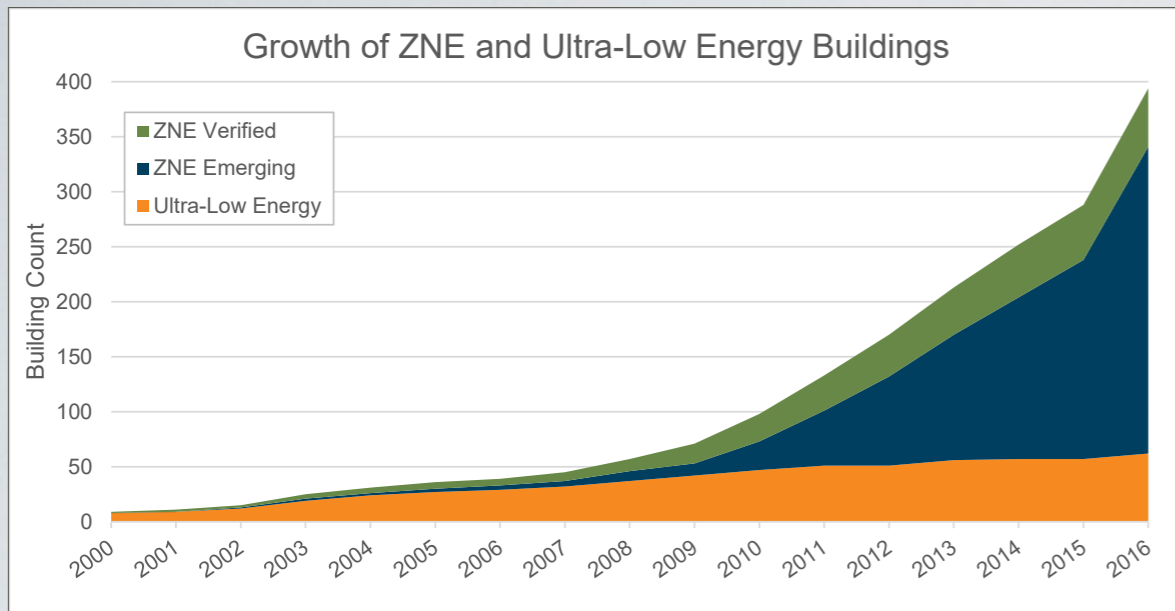
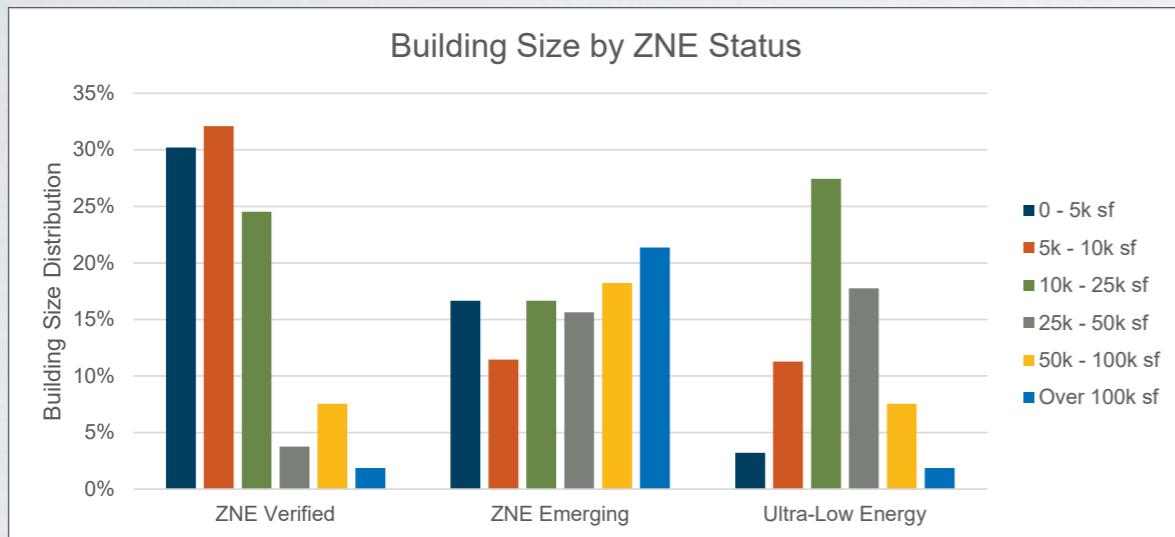
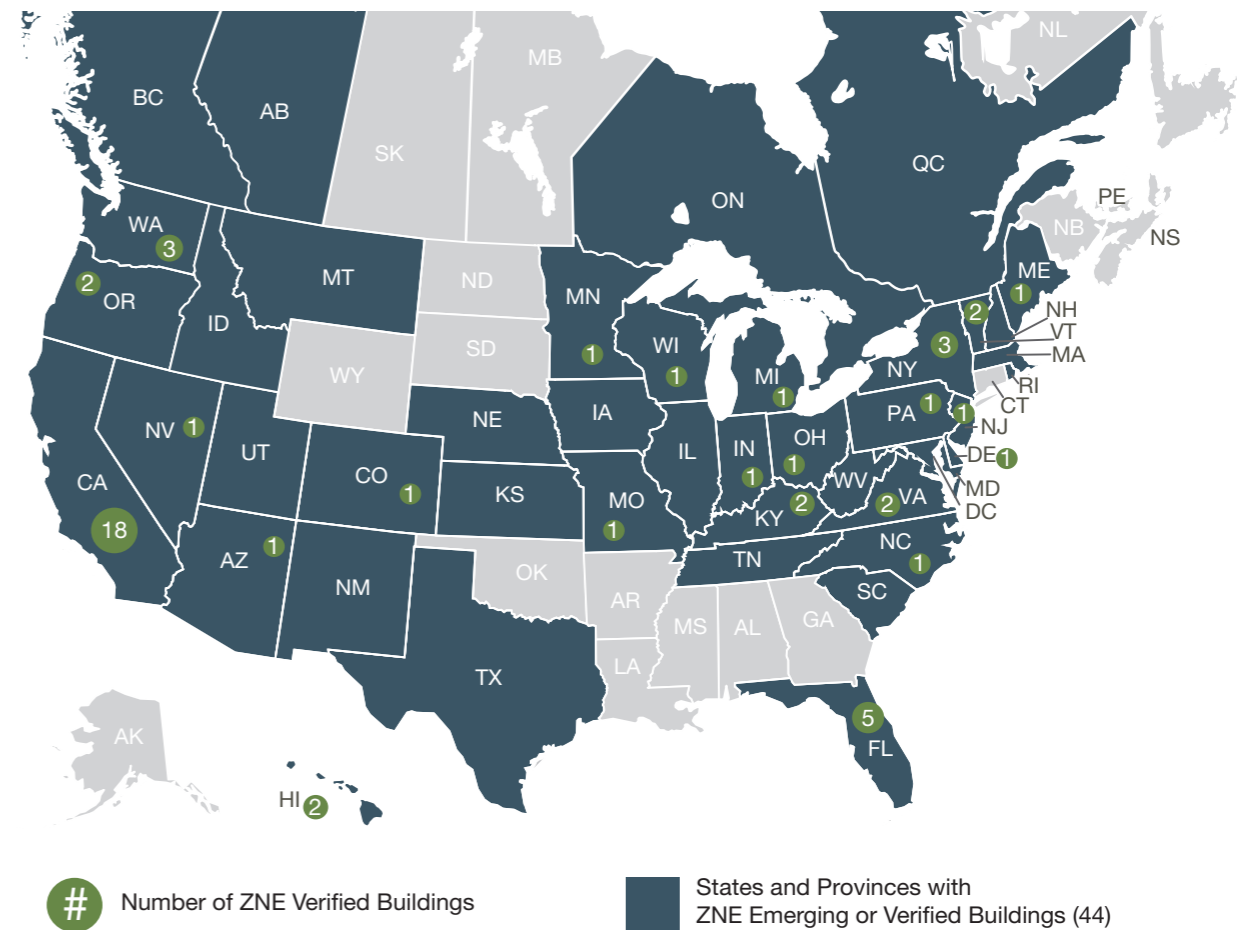


Fig. 2. (above) The total ZNE buildings population tracked by NBI has grown 74% since 2015.

Fig. 3. (below) ZNE Emerging projects shows a growing diversity of building size.



### ZNE Building Locations in North America

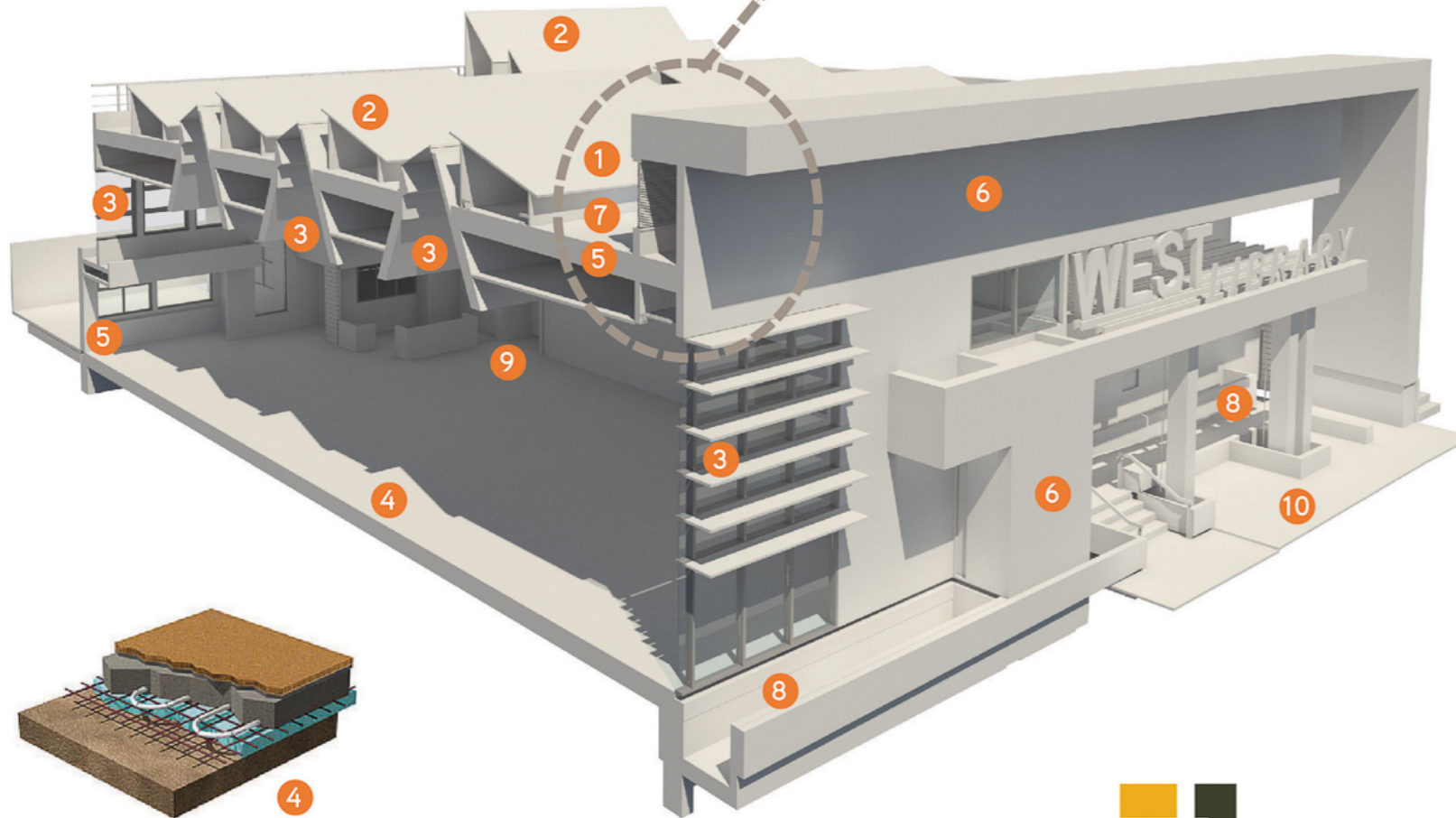
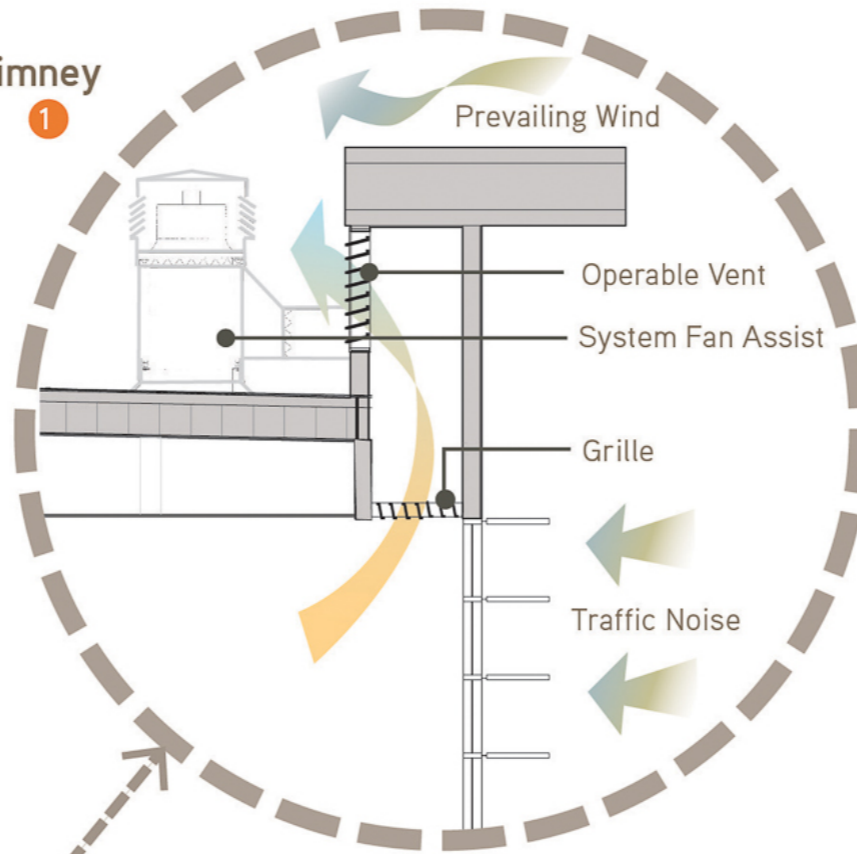




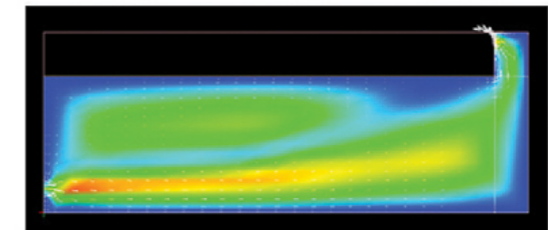
# POWER LESS

電気をいらない

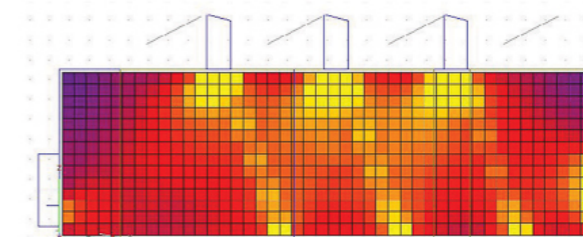
## Thermal Chimney



- 1 Natural Ventilation / Mix Mode
- 2 On Site Energy Generation- PV & Solar Thermal
- 3 Daylighting- 90% of Spaces is Daylit
- 4 Radiant Floor for Heating & Cooling
- 5 FSC Certified Wood
- 6 High Performance Exterior Rain Screen (R30)
- 7 Cool Roof (R40)
- 8 Low Flow Planters- On Site Storm Water Technology
- 9 High Recycled Content
- 10 Dense Urban Site / Site Selection



Computer Fluid Dynamics Modeling



Daylight Studies Modeling



HARLEY ELLIS DEVEREAUX

Zero Net Energy Features