The Global Energy Picture & the Importance of Tribal Community Energy Planning

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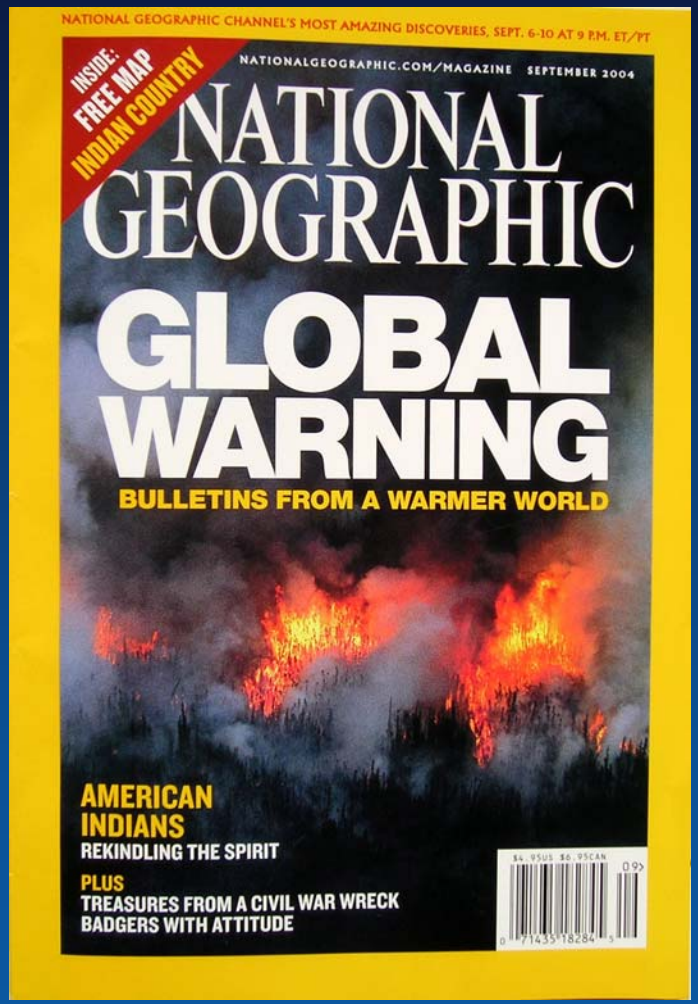
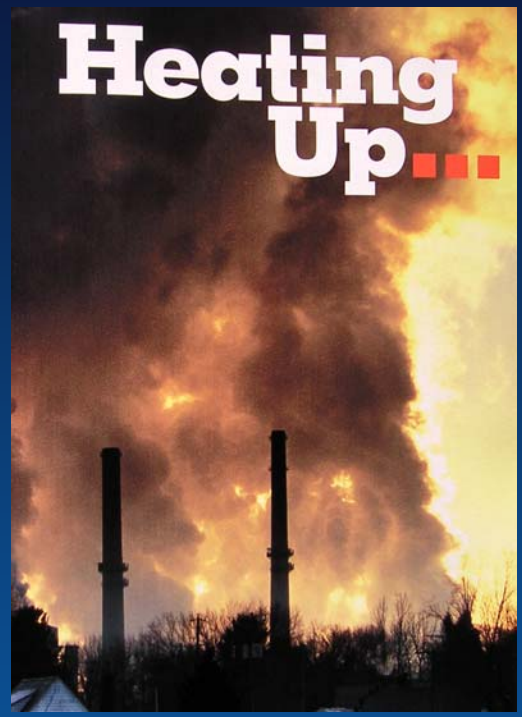
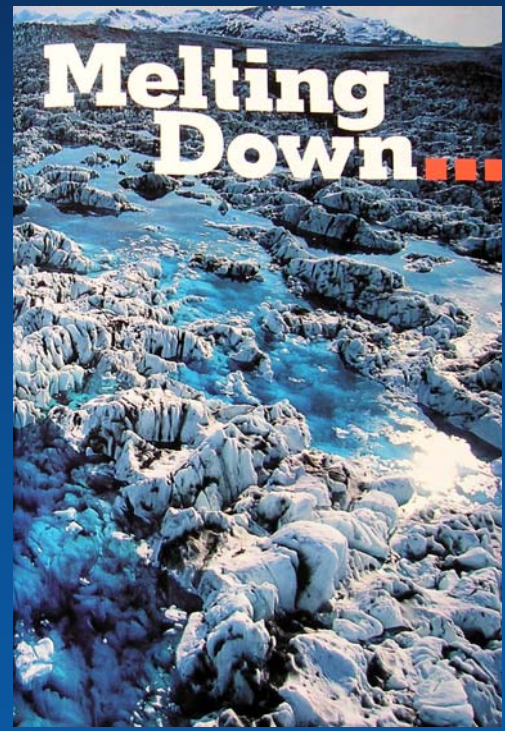
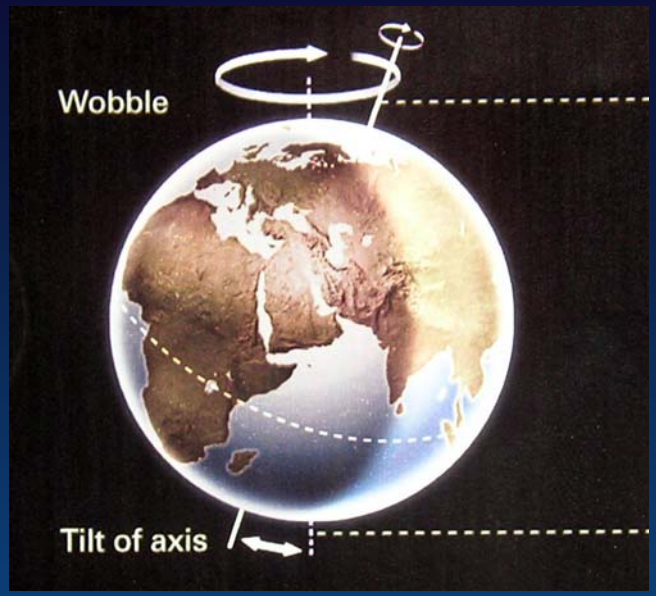
NREL

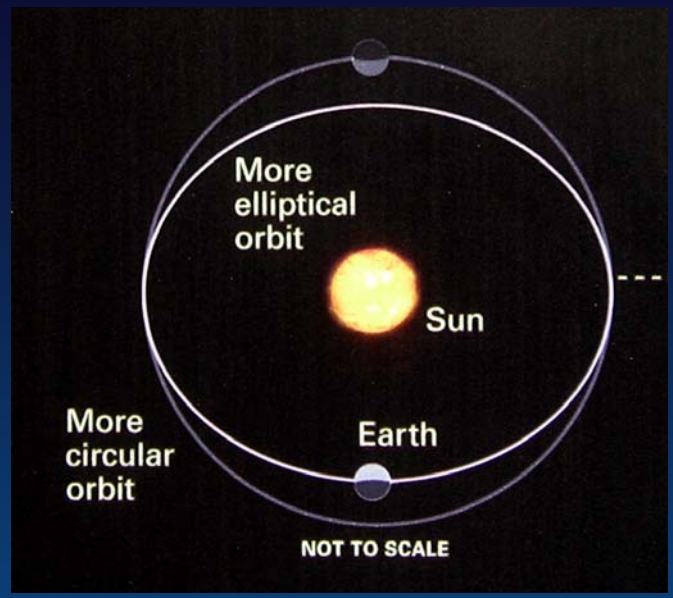
We Live in a Changing World

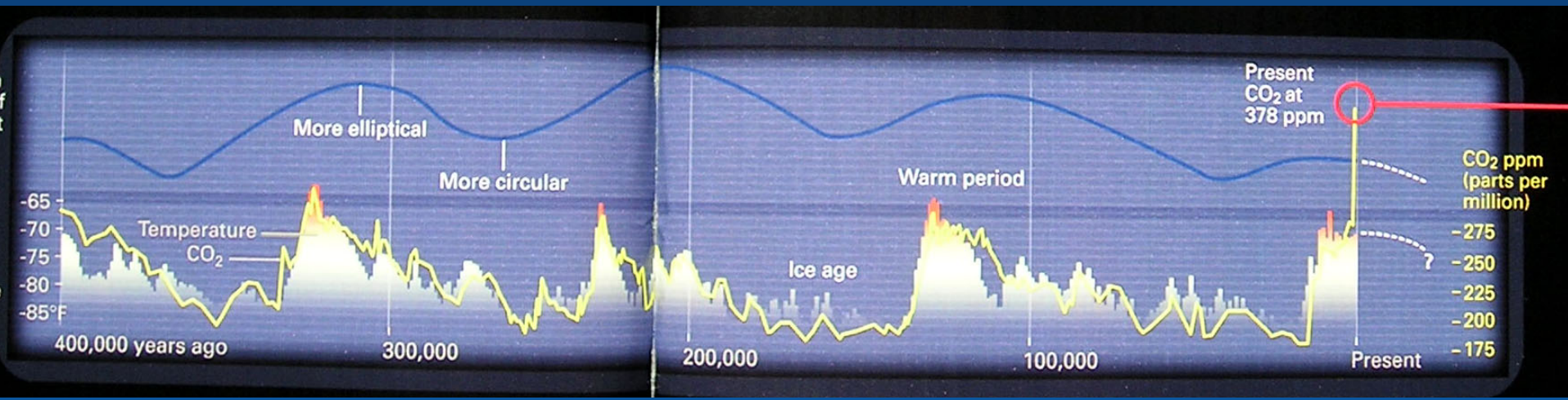




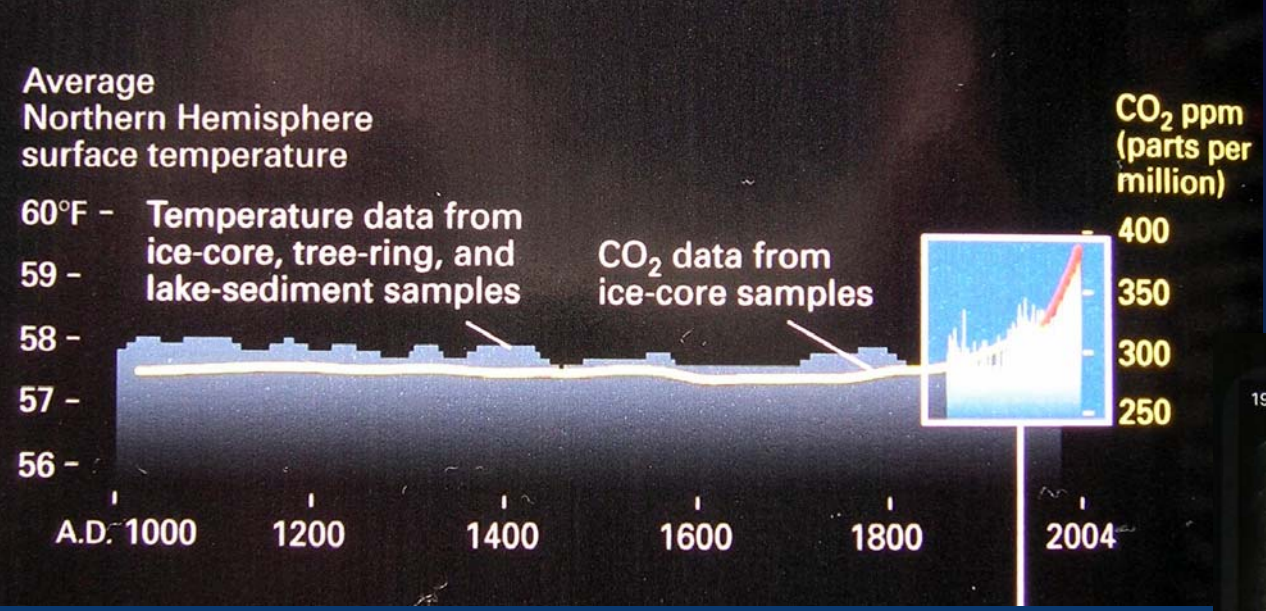








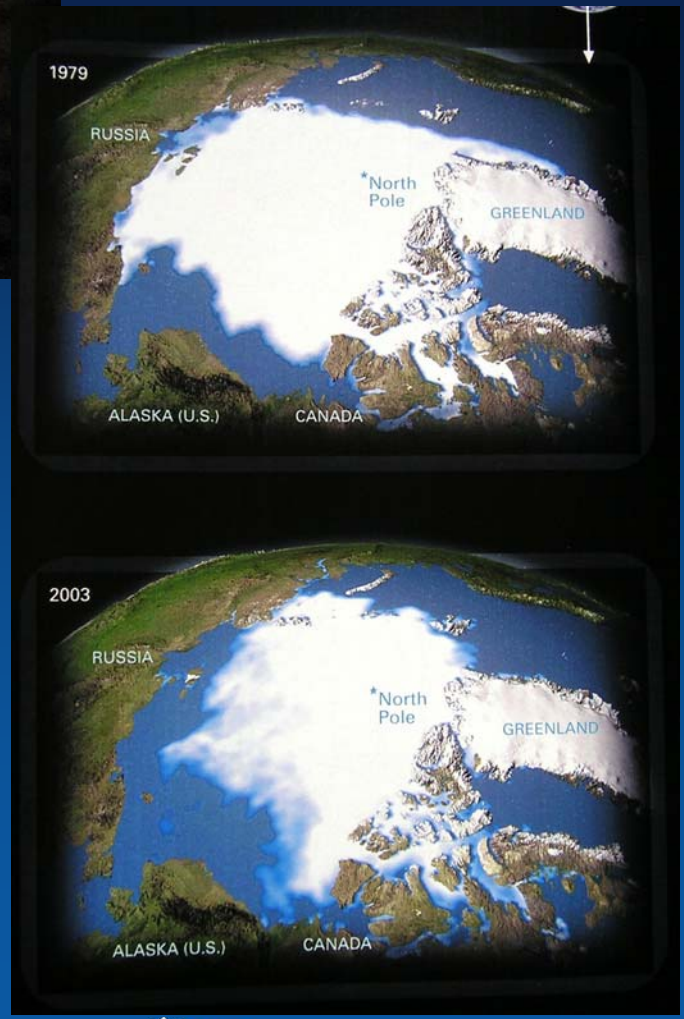
Unprecedented Levels of CO_2

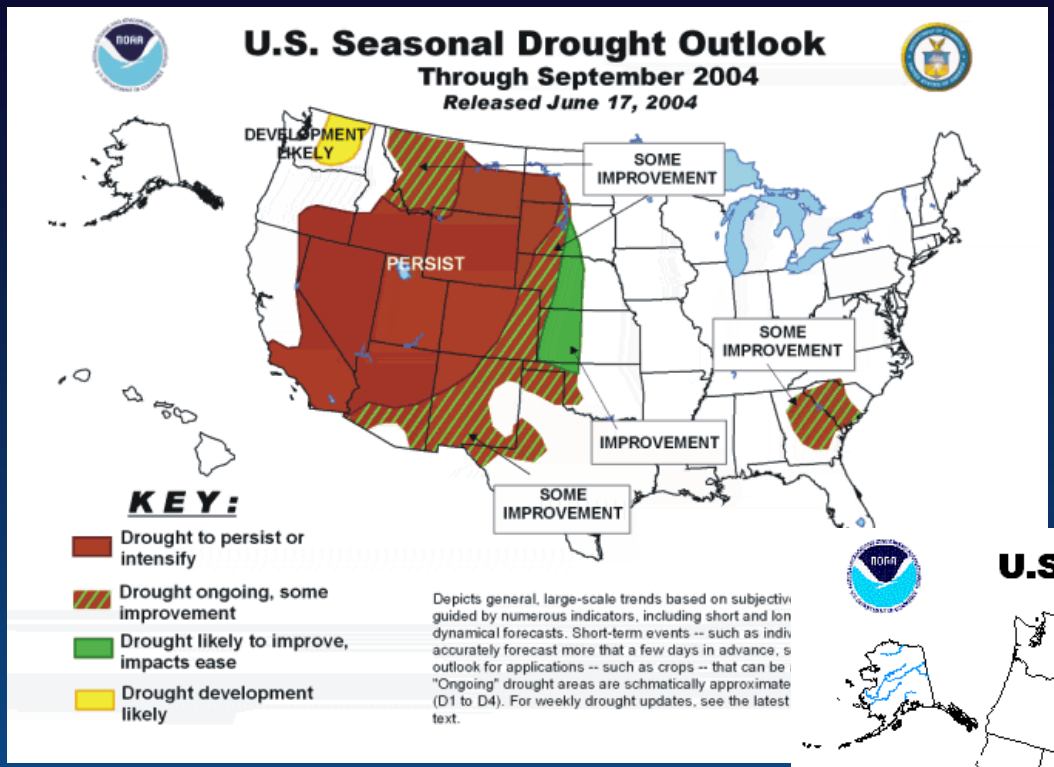


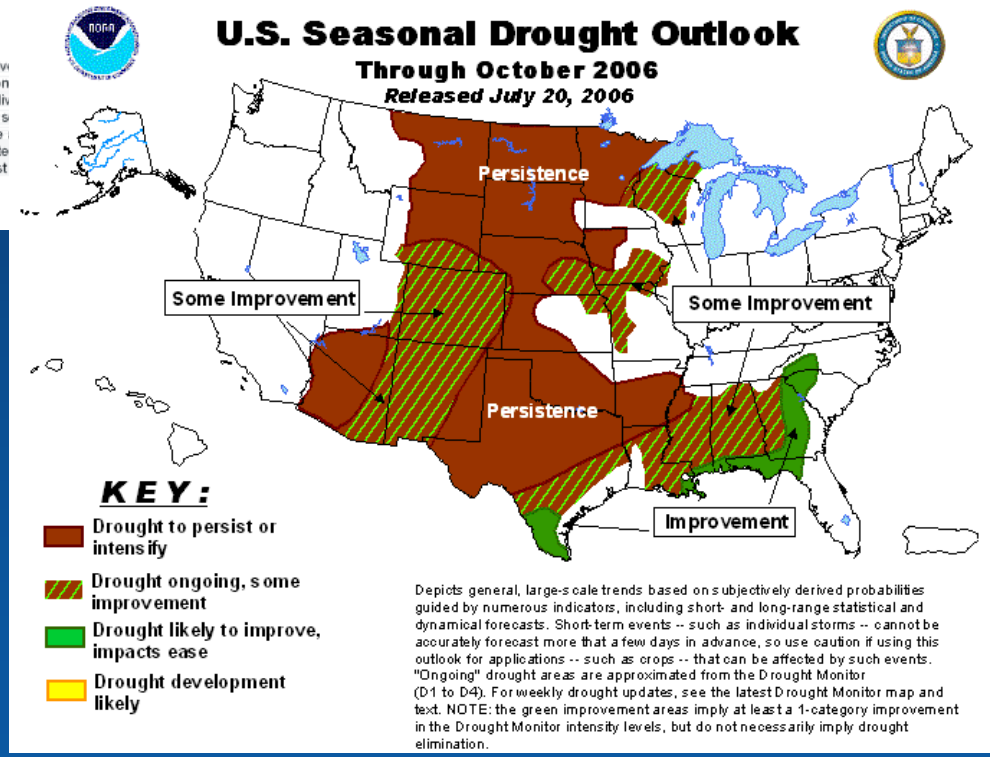
Warming Temperatures

Reducing Ice Pack

9%/year

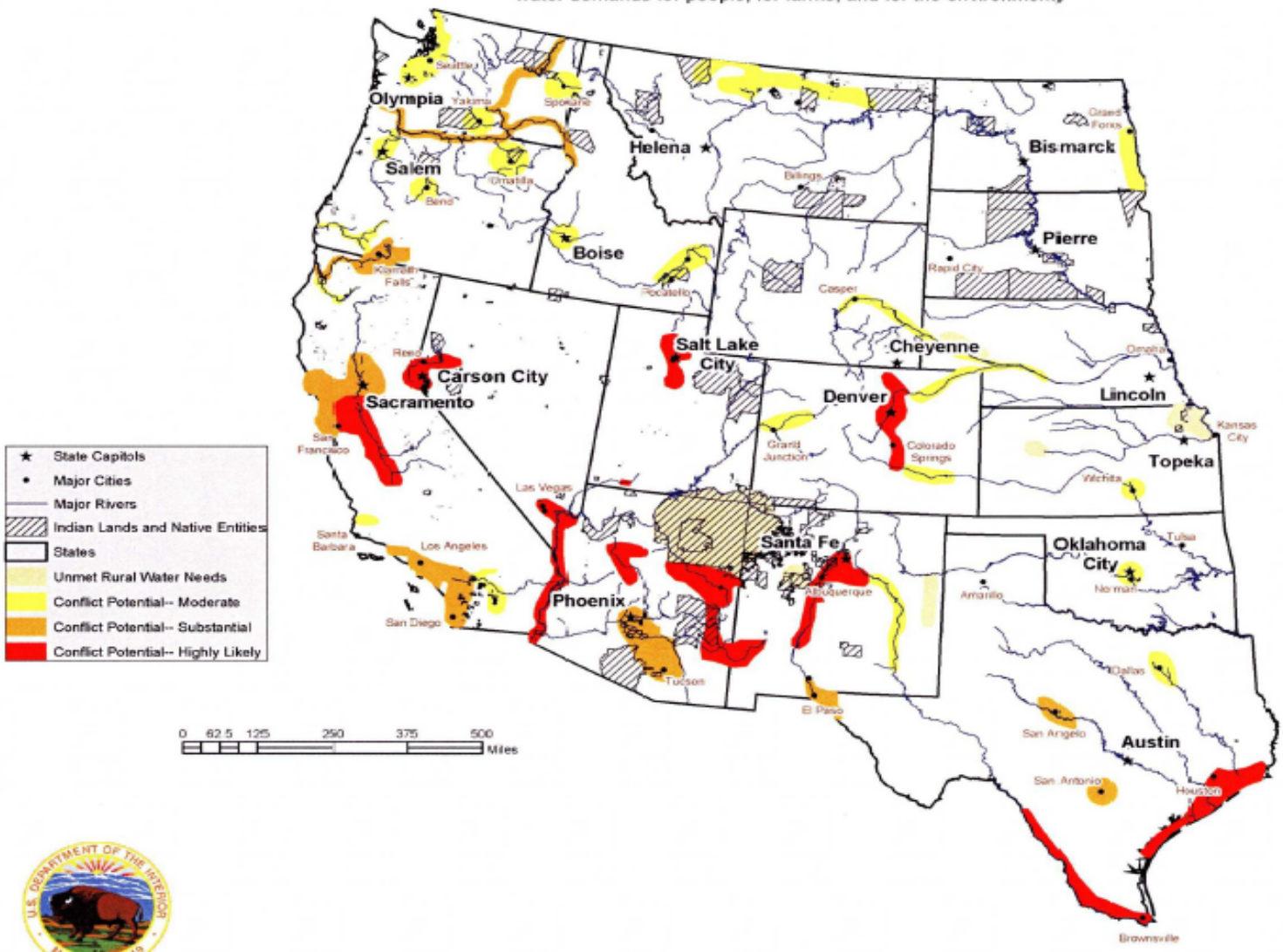


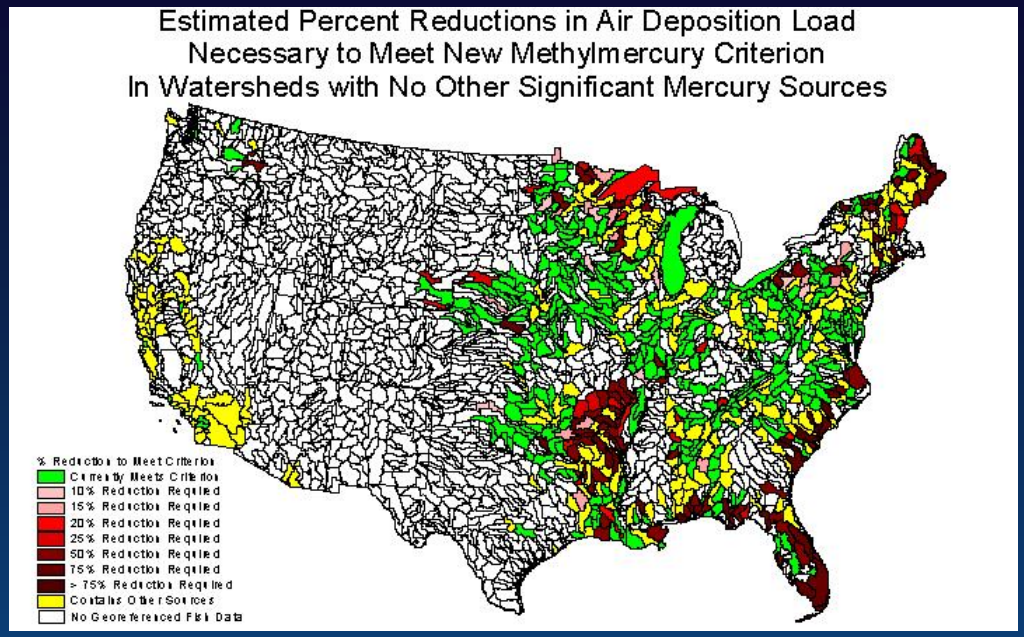

U.S. Seasonal Drought Outlook
Through September 2004
Released June 17, 2004
DEVELOPMENT LIKELY
SOME IMPROVEMENT
PERSIST
SOME IMPROVEMENT
IMPROVEMENT
SOME IMPROVEMENT
KEY:
Drought to persist or intensify
Drought ongoing, some improvement
Drought likely to improve, impacts ease
Drought development likely
Depicts general, large-scale trends based on subjectiv
guided by numerous indicators, including short and lon
dynamical forecasts. Short-term events -- such as indiv
accurately forecast more that a few days in advance, s
outlook for applications -- such as crops -- that can be
"Ongoing" drought areas are schmatically approximate
(D1 to D4). For weekly drought updates, see the latest
text.


U.S. Seasonal Drought Outlook
Through October 2006
Released July 20, 2006
Persistence
Some Improvement
Some Improvement
Persistence
Improvement
KEY:
Drought to persist or intensify
Drought ongoing, some improvement
Drought likely to improve, impacts ease
Drought development likely
Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more that a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Potential Water Supply Crises by 2025

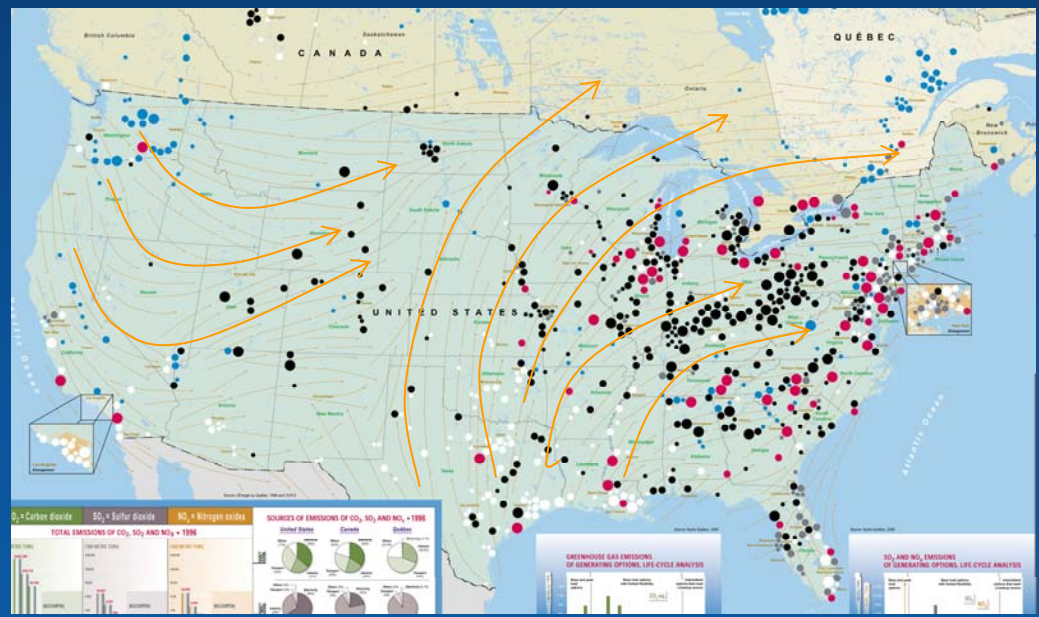
(Areas where existing supplies are not adequate to meet water demands for people, for farms, and for the environment)



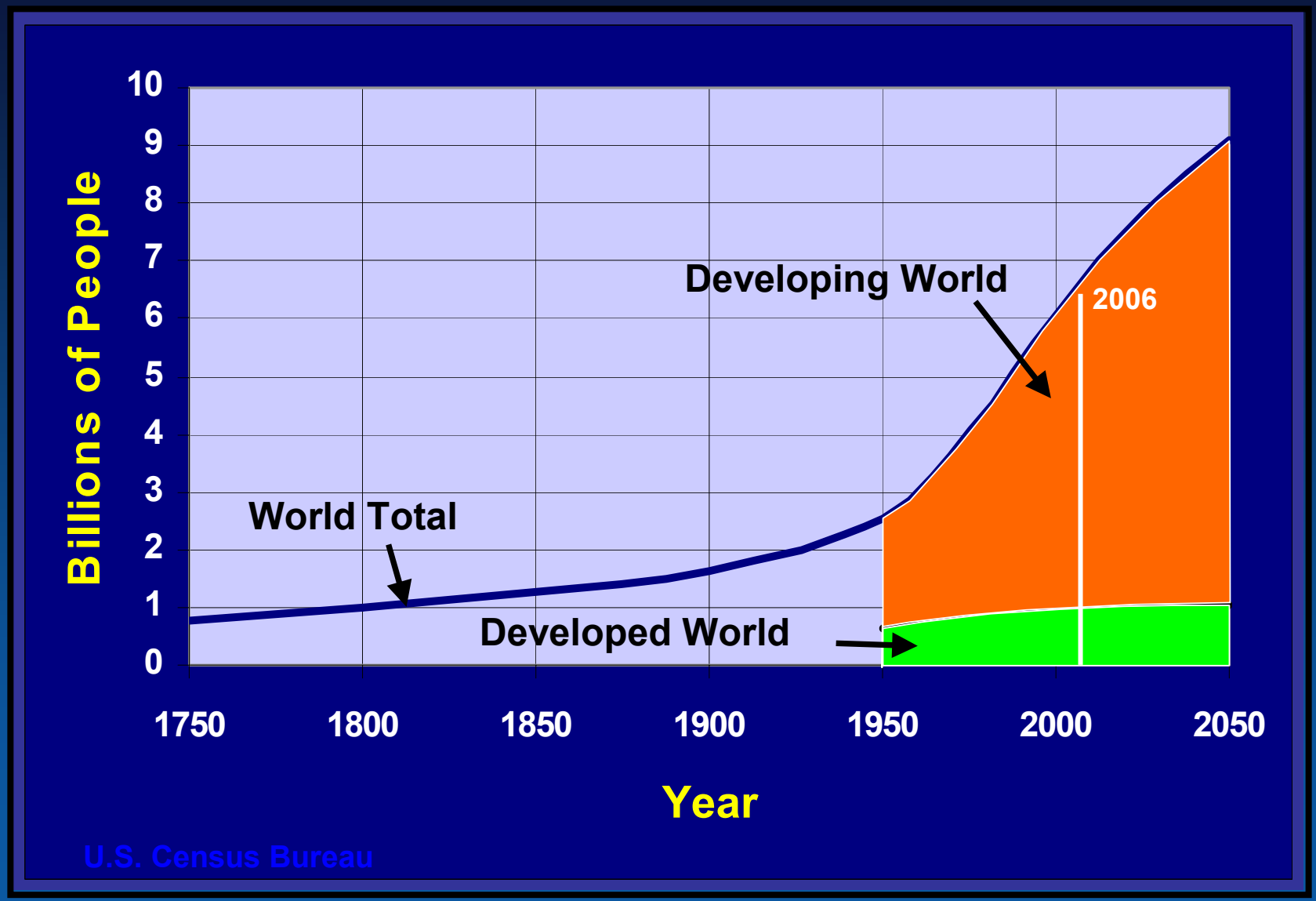


Mercury Contamination of Fish

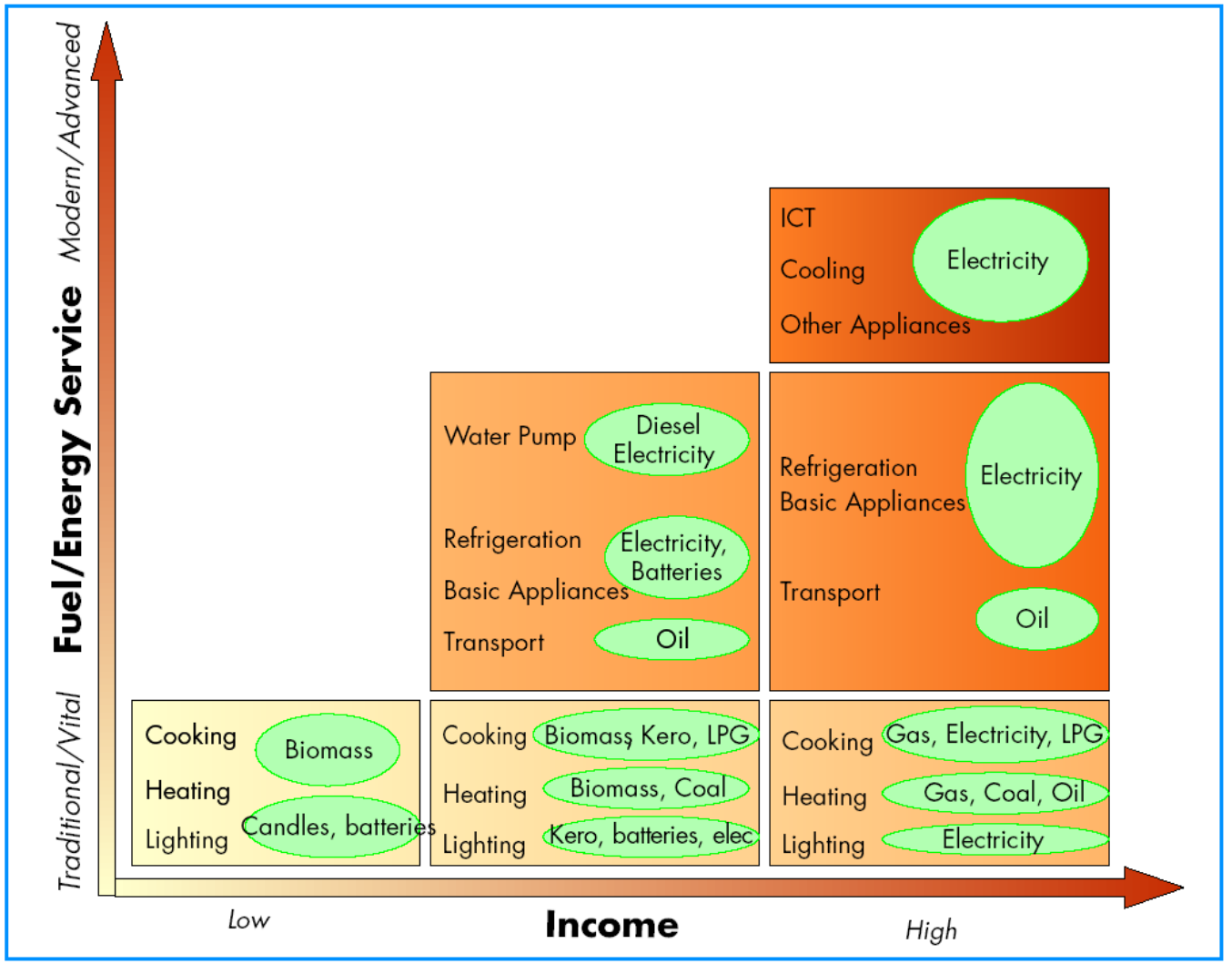
Closely correlated with Power Plant Emissions



Demand


Billions of People
10
9
8
7
6
5
4
3
2
1
0
1750
1800
1850
1900
1950
2000
2050
Year
Developing World
2006
World Total
Developed World
U.S. Census Bureau

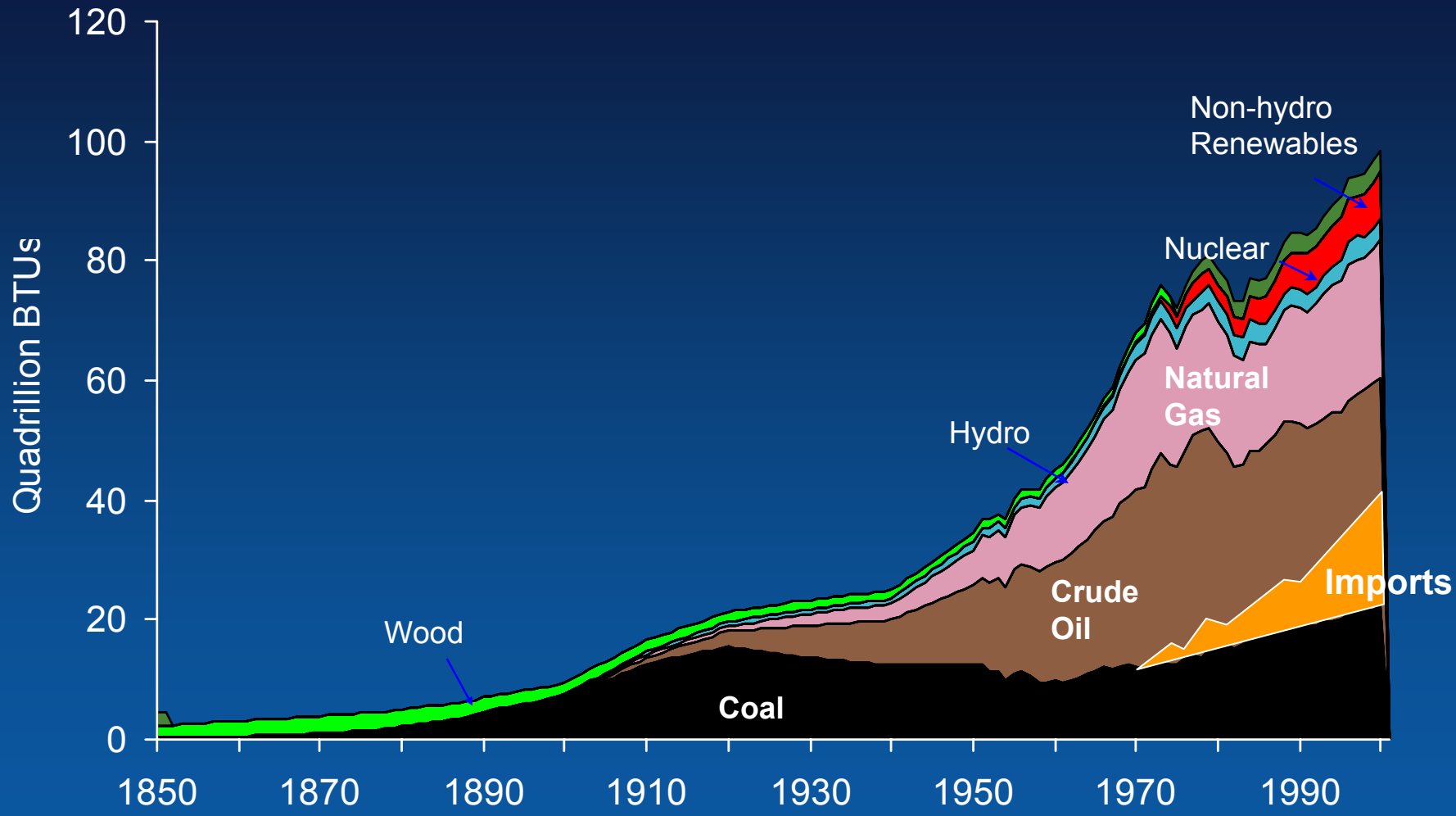
Modern energy services require increased incomes



Note: ICT is information and communication technology.
Source: IEA analysis.

U.S. Energy Consumption

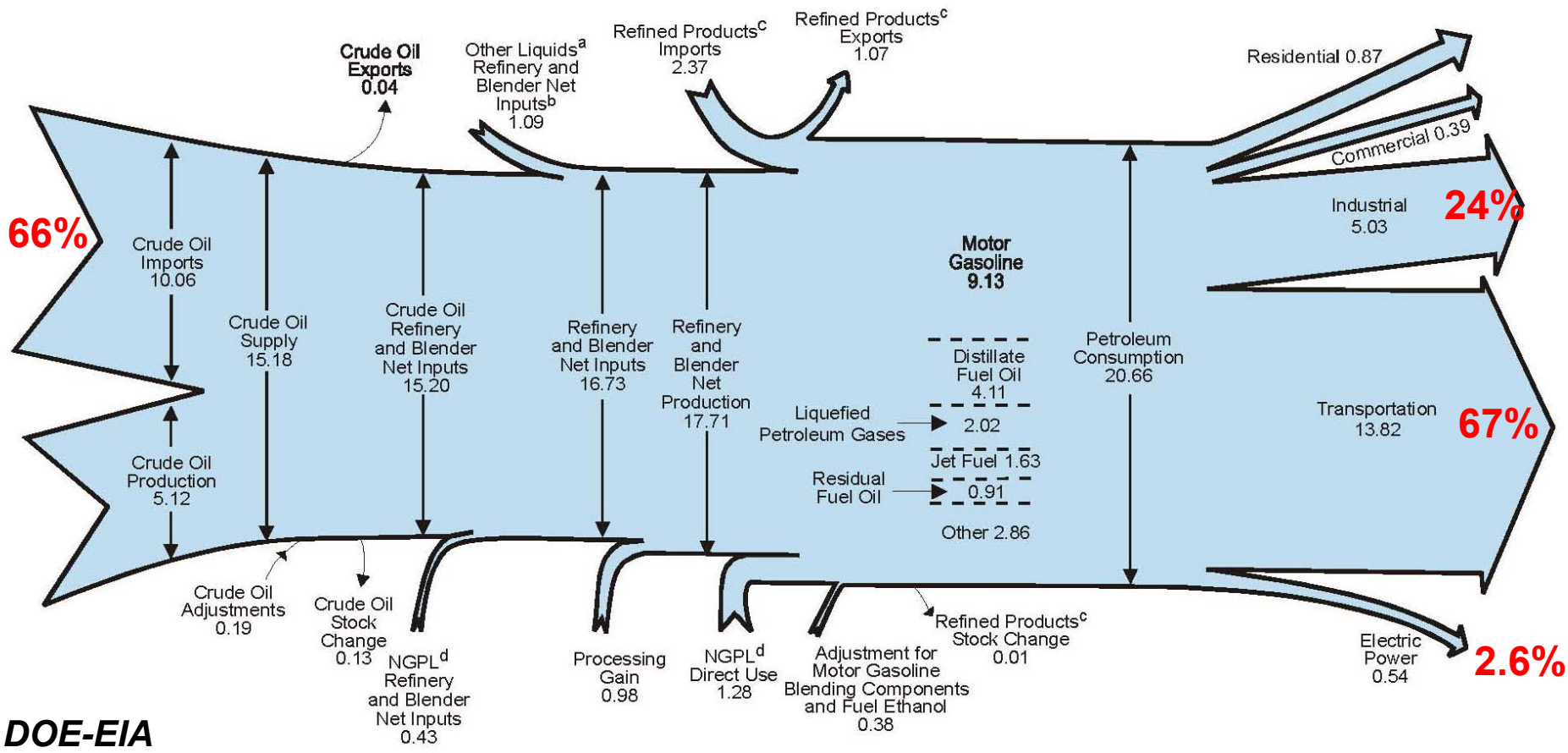
by source - 1850-2000



Source: 1850-1949, Energy Perspectives: A Presentation of Major Energy and Energy-Related Data, U.S. Department of the Interior, 1975; 1950-2000, Annual Energy Review 2000, Table 1.3

U.S. Petroleum Flow, 2005

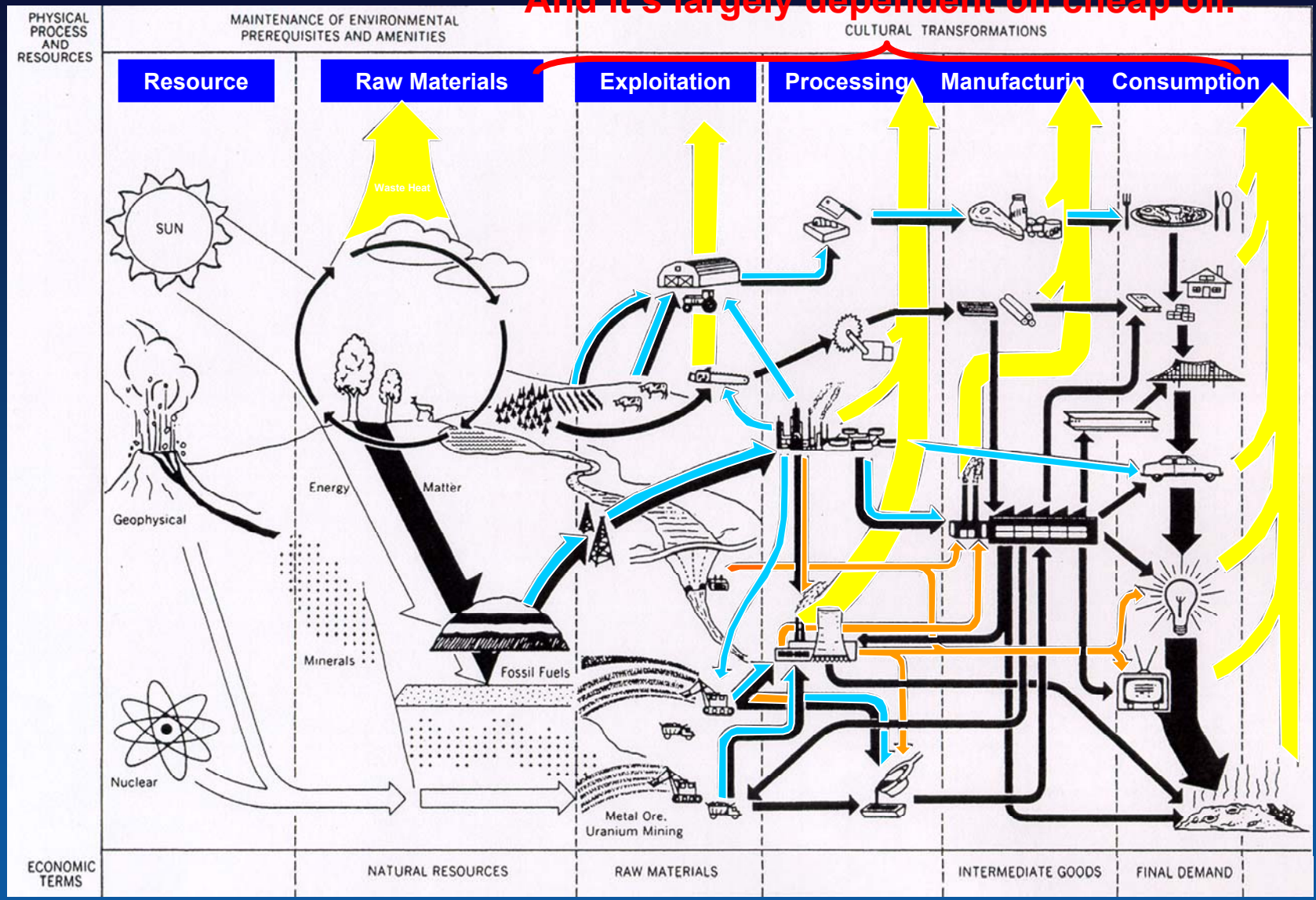
Millions of Barrels per Day



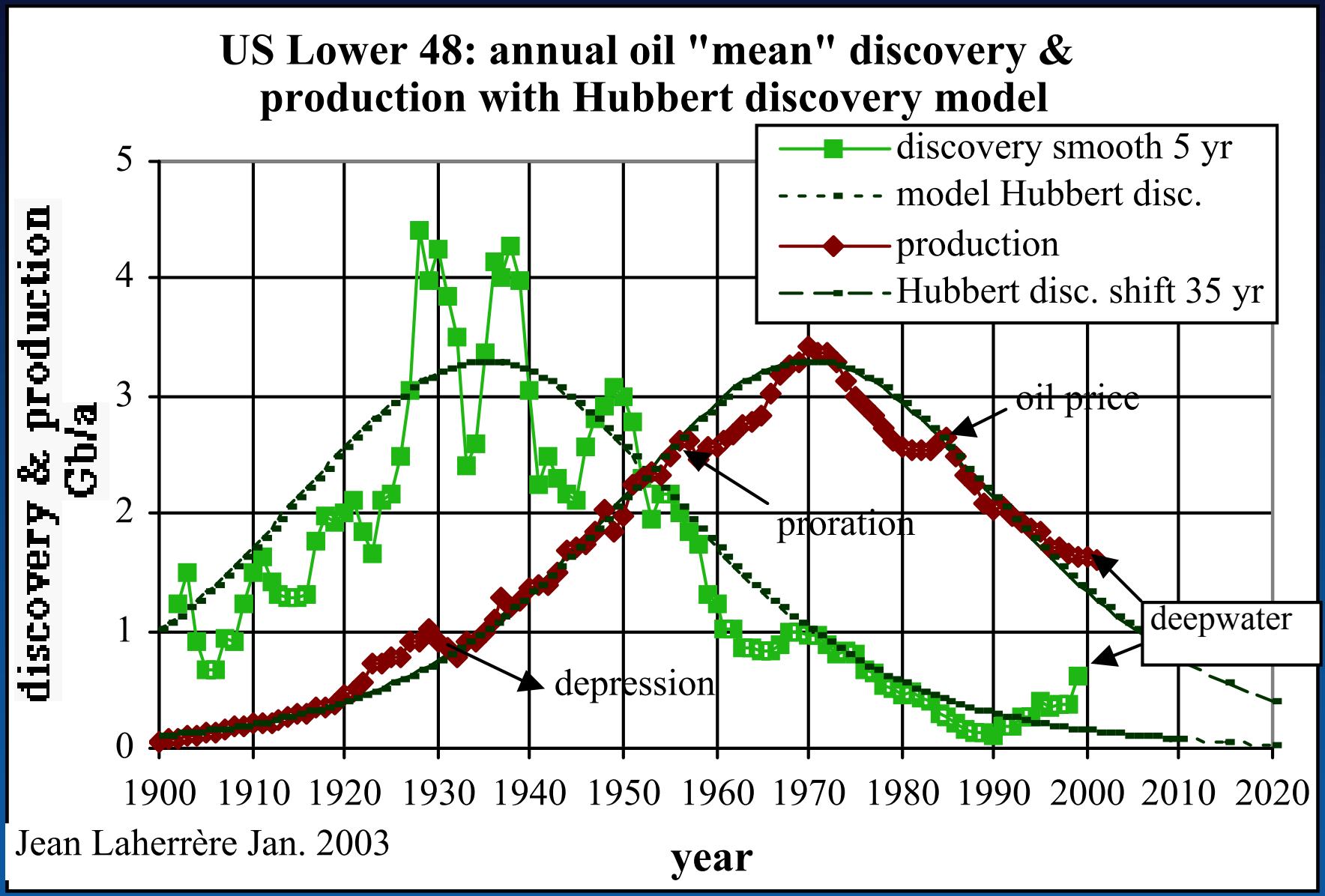
DOE-EIA

Where the global economy is very complex

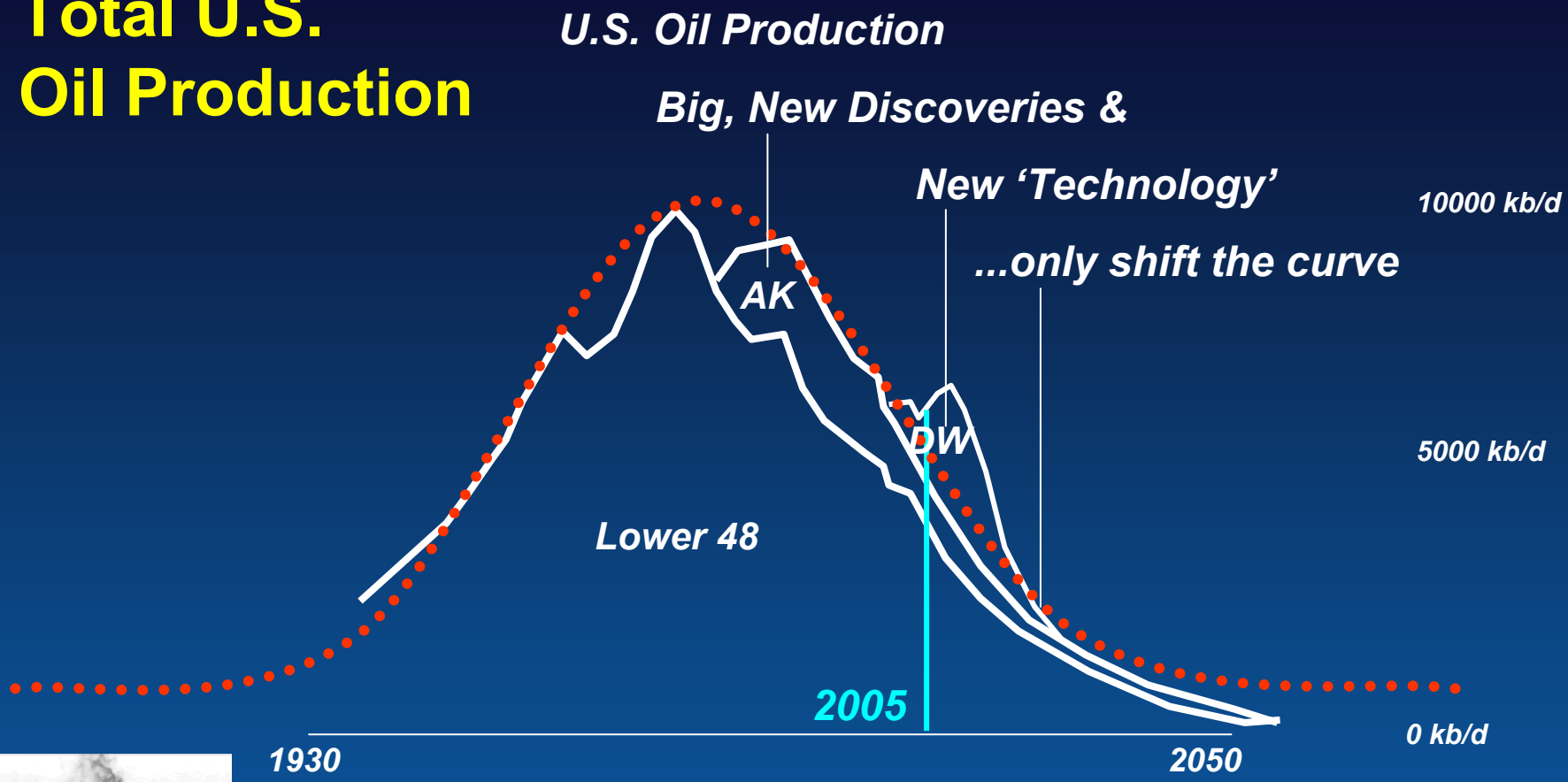
And it's largely dependent on cheap oil.

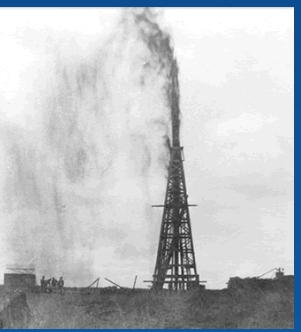


US Lower 48


US Lower 48: annual oil "mean" discovery & production with Hubbert discovery model
discovery smooth 5 yr
model Hubbert disc.
production
Hubbert disc. shift 35 yr
discovery & production Gb/a
oil price
proration
deepwater
depression
0
1
2
3
4
5
1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020
year
Jean Laherrère Jan. 2003

Total U.S. Oil Production





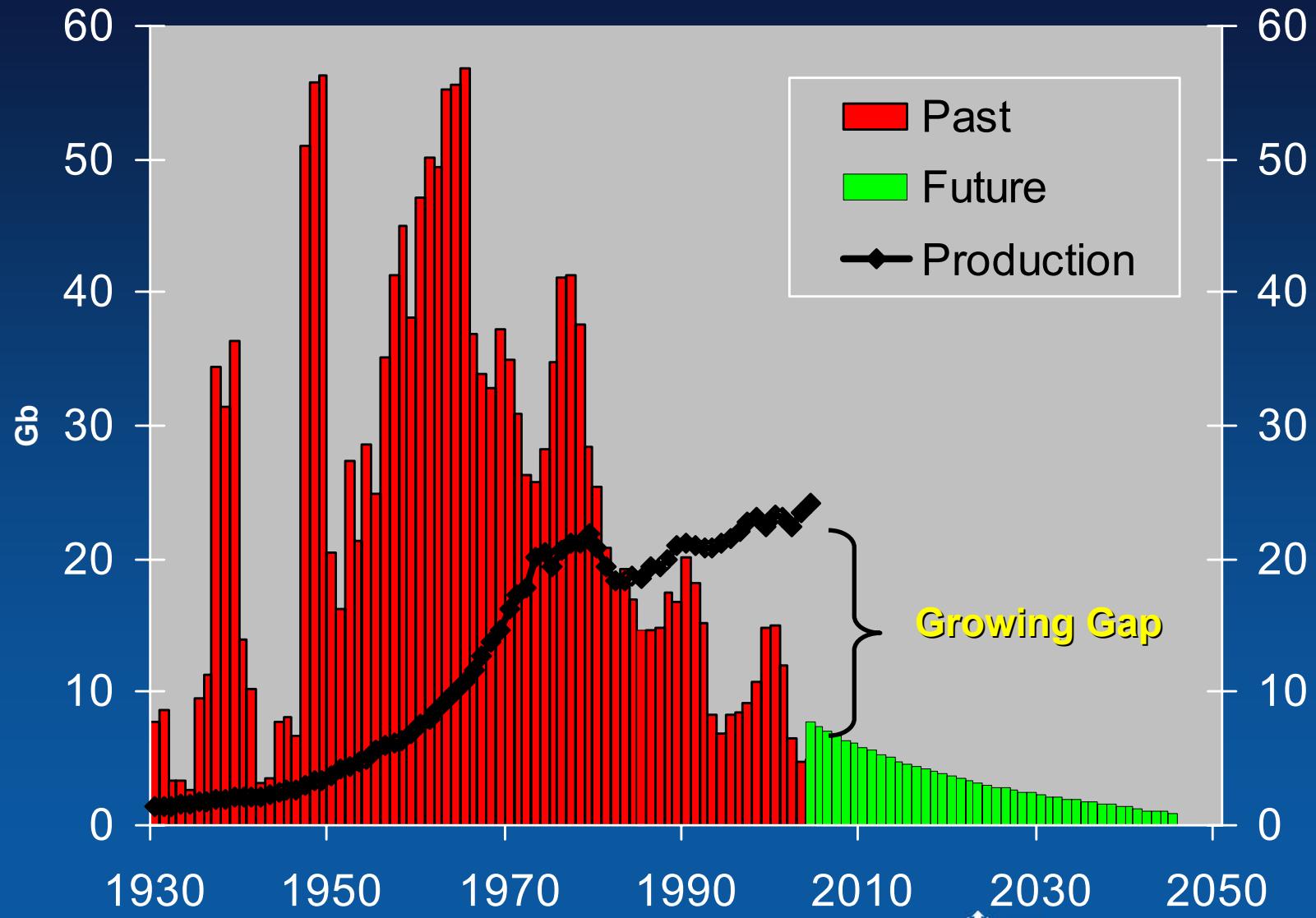
Lower 48

Alaska

Deepwater

Source: Tom Petrie at Denver World Oil Conference

Worldwide Discovery Trend



Source: Campbell, May 2005

7 Generations Span The Age of Oil & NG

Our Grand Parents

Our Parents

Our Generation

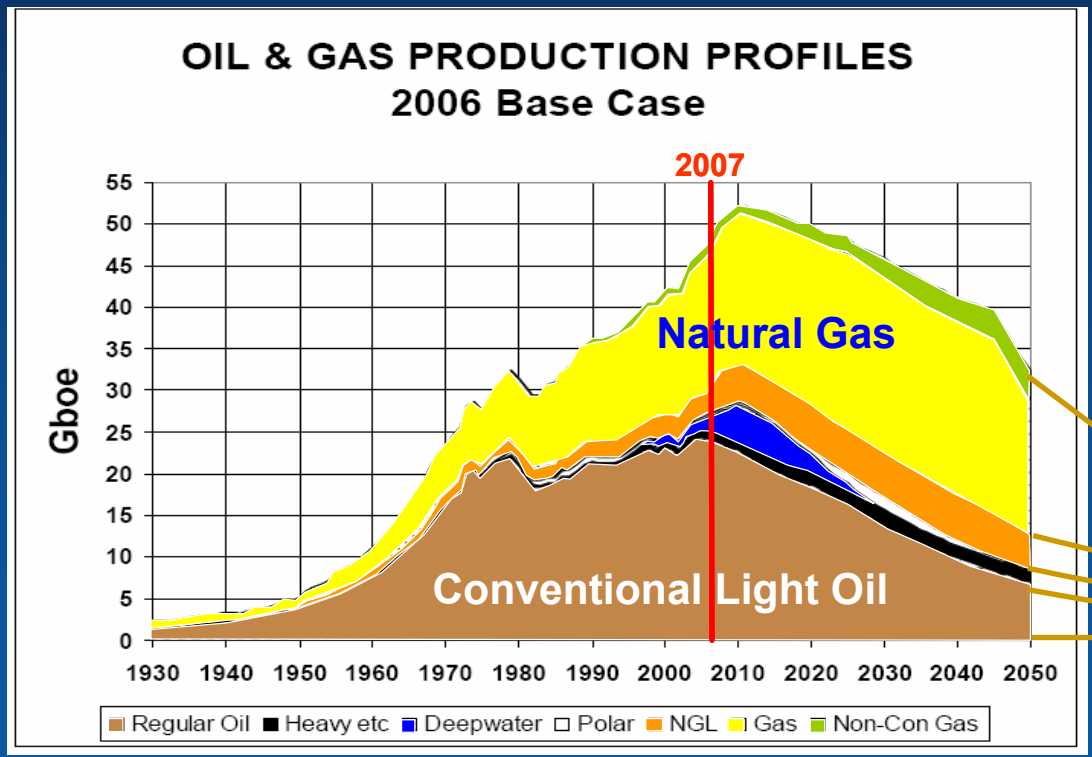
30 80

Our Children

Our Grand Children

Our Great Grand Children

Our Great-Great Grand Children

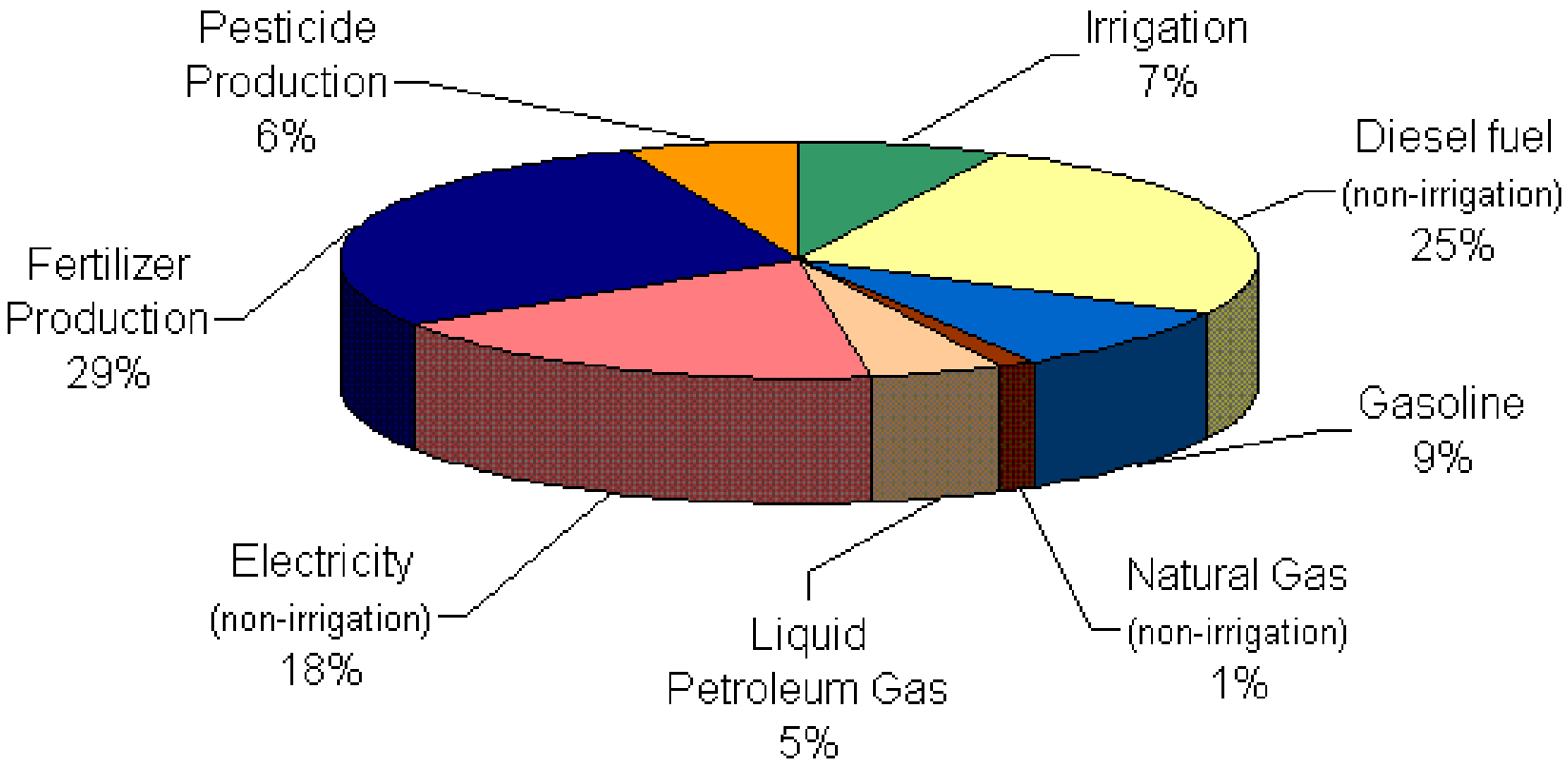


2100

Peak Oil Graph from: ASPO.com - Colin Campbell 2007

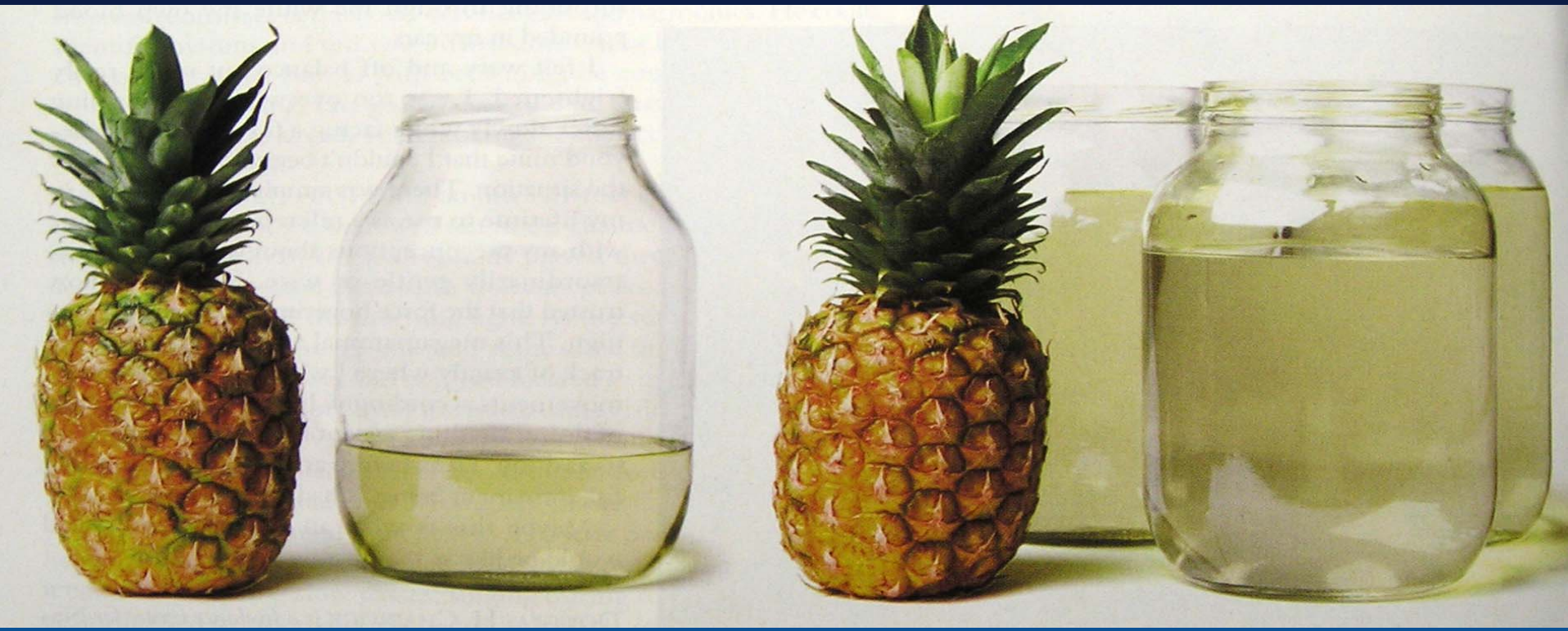
U.S. Farm Energy Use, 2002

~75% Petroleum (assuming electric Irrigation)



Earth Policy Institute from USDA & DOE data

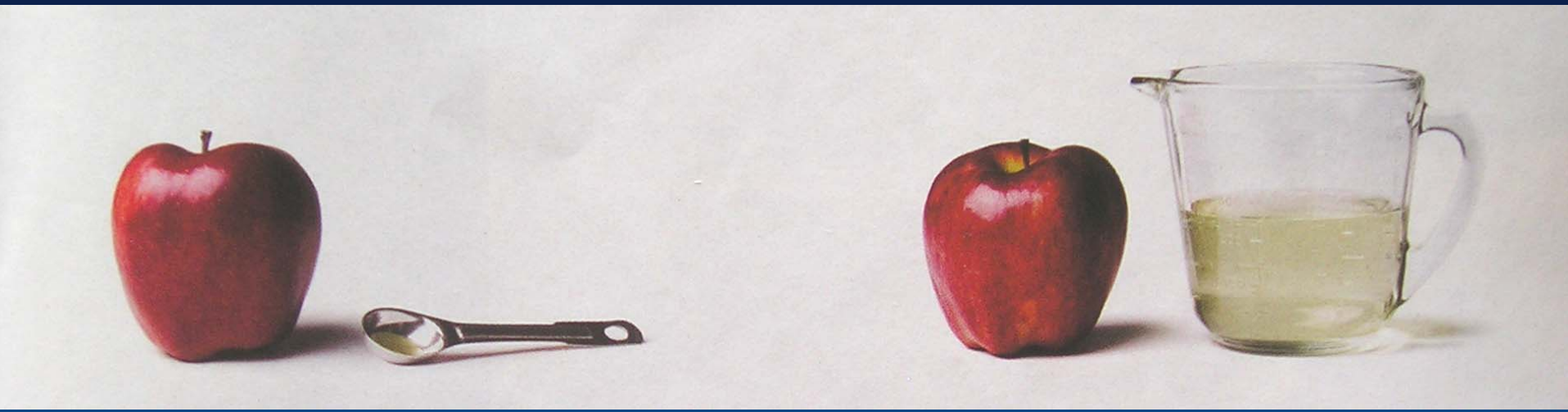
Pineapples to Des Moines



By sea from Costa Rica
0.3 gallons

By air from Hawaii
2.8 gallons

Apples to Des Moines



From within Iowa
1.7 teaspoons

From Washington state
1 cup

True costs of industrial food production system

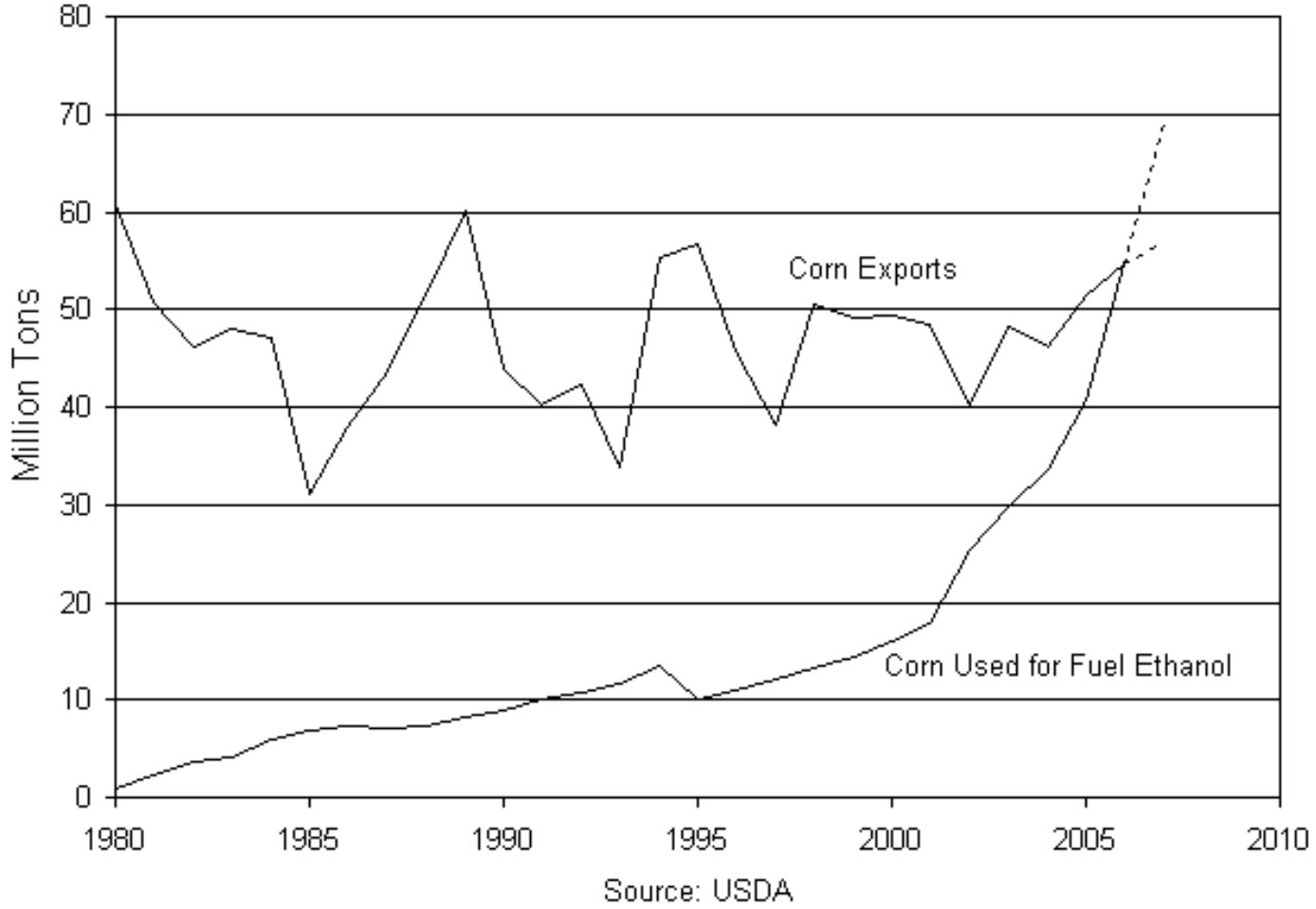
- 1,000 tons of water are consumed to produce one ton of grain
- 10 energy units are spent for every energy unit of food on our dinner table
- 1,000 energy units are used for every energy unit of processed food
- 17% of the total energy use in the United States goes into food production & distribution, accounting for more than 20% of all transport within the country; this excludes energy used in import & export
- 90% of the agricultural subsidies benefit corporations and big farmers growing food for export

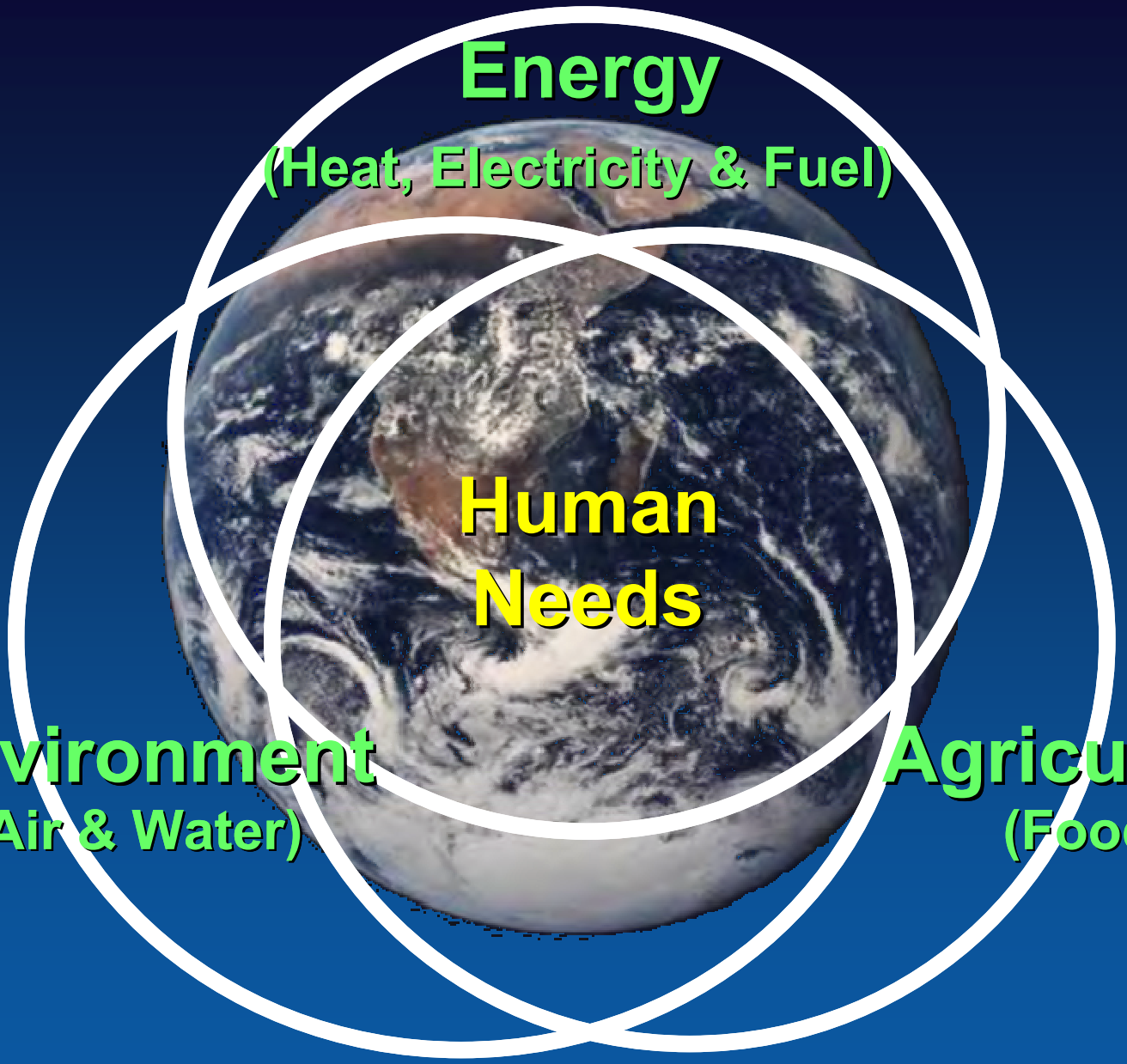
Institute of Science in Society, April 2005

Some benefits of sustainable food production systems

- 2- to 10-fold energy saving on switching to low-input/organic agriculture
- 5 tons of carbon dioxide emission disappear with every ton of nitrogen fertilizer phased out
- Organic foods contain more vitamins, minerals and other micronutrients than conventionally produced foods
- Buying food in local farmers' market generates twice as much for the local economy than buying food in supermarkets chains

U.S. Corn Use for Fuel Ethanol and for Export, 1980-2006, with Projection to 2007





Are we already exceeding the carrying-capacity of the planet?

Community Energy Security & Sovereignty Through Local Self-Sufficiency

Economic Dependence

Oil Imports
Fuel at the Pump
National Grid
Central Station Power
Water Transport
Foreign Manufacturing
Agro-Industry

"He who has the gold, makes the rules."

Community Independence

Local Self Sufficiency
Food
Energy
Water

Skill Rebuilding
Local Production
Regional Sourcing

Sufficiency & Enoughness
Human Satisfaction

"Community of Cooperation"

Tribal Strategic Energy Planning


Energy
(Heat, Electricity & Fuel)
Community
Solution
Environment
(Air & Water)
Agriculture
(Food)