



# **Responding to the Crisis of Energy Depletion**

presentation to the

## **Lawrence City Commission**

by the

## **Sustainability Action Network**

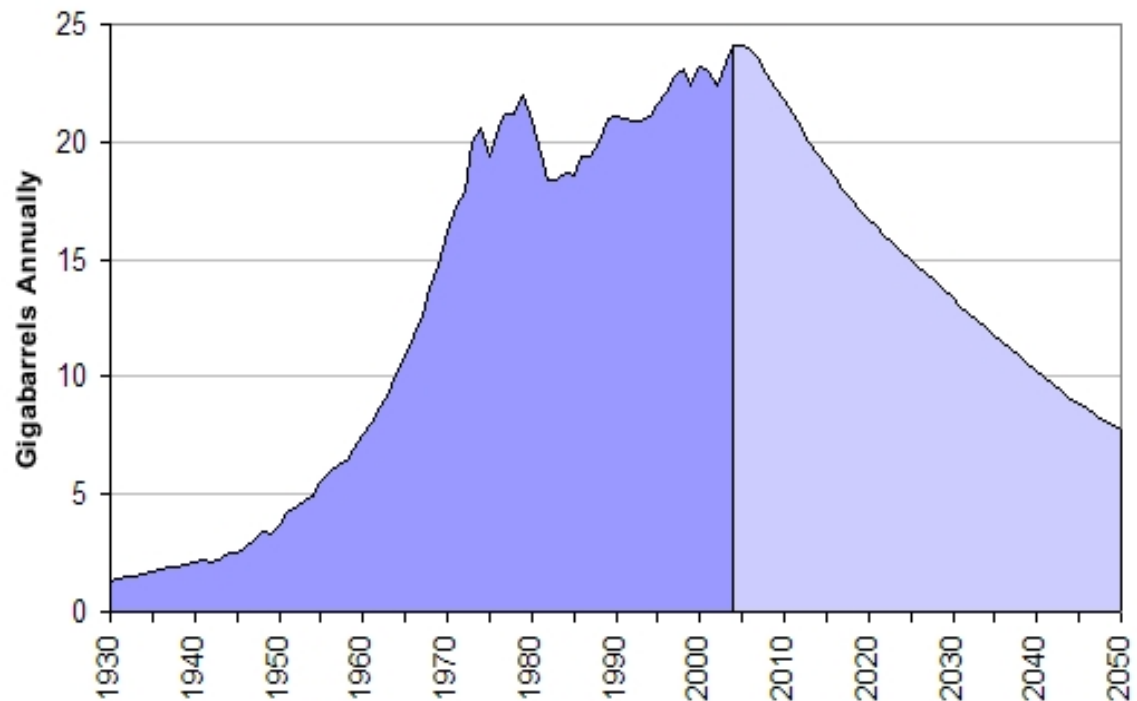
# Depletion of Petroleum Fuels

## Hubbert's Peak

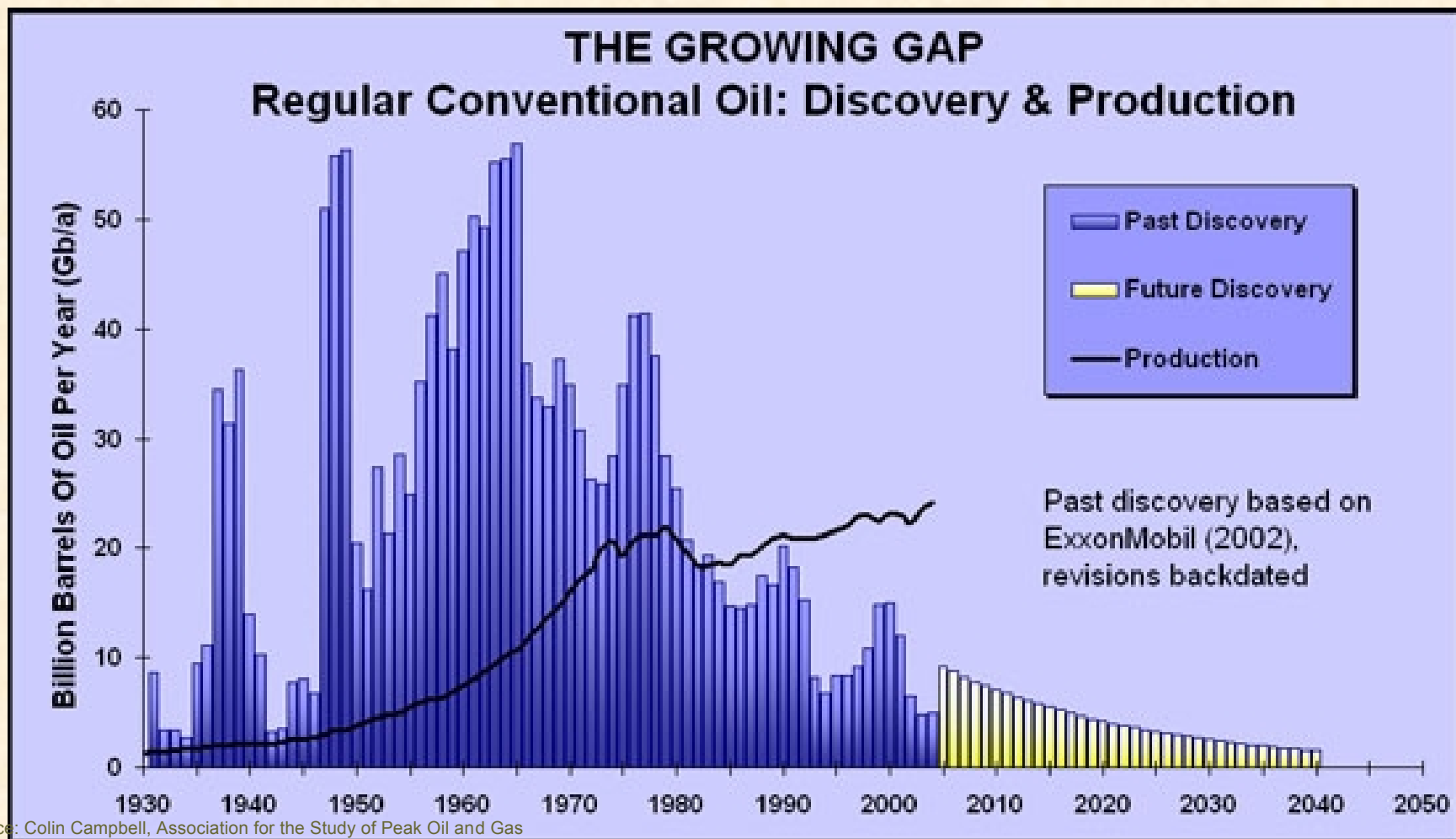
balance of new  
discoveries,  
proven reserves  
& production

Increasing demand  
+ declining production = high petroleum prices &  
deflating economy

**Global Petroleum Production Curve**



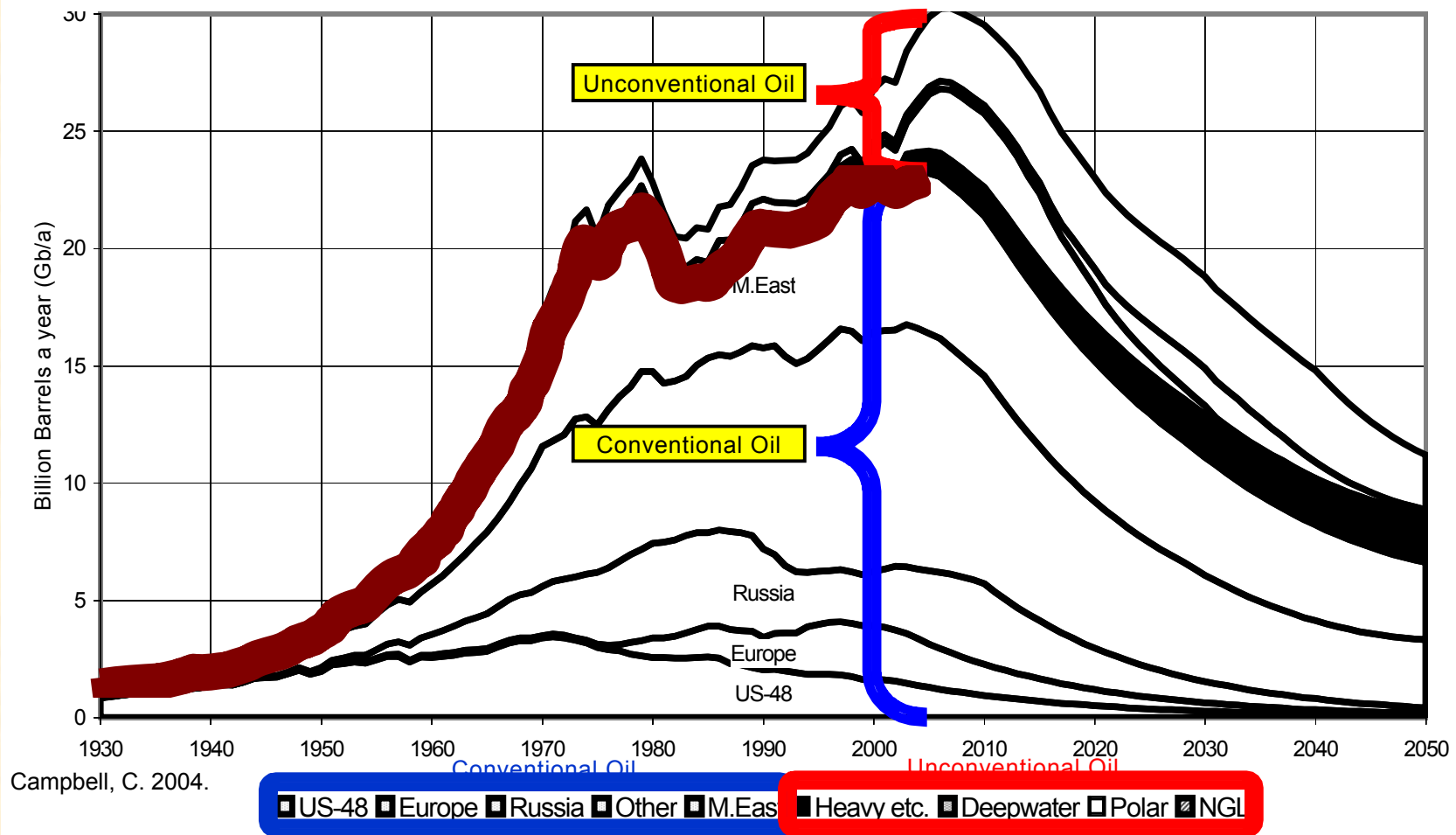
# Petroleum Discovery & Extraction



Post Carbon Institute

# History and Projection of World Oil (and Gas Liquids) Production, 2004

History and Projection of World Oil (and Gas Liquids) Production, 2004



# Global Peak Oil

Peak Oil is the convergence of three trends:

- Proven reserves are being extracted at capacity
- Rate of new discoveries are declining
- Demand is growing faster than production, especially in China & India



# Peak Oil, When does depletion begin?

- 2005-2006 Brown, Lester World Policy Institute
- 2005-2006 Deffeyes, K.S. Prof. Emeritus, Princeton
- 2005-2006 Pickens, T Boone Mesa Petroleum Geologist
- 2006-2007 Bakhtiari, A.M.S. Iranian oil executive
- 2007-2009 Simmons, M.R. Energy Investment Banker
- 2008-2018 Aleklett, Kjell Assoc. Study of Peak Oil
- Before 2010 Goodstein, D. Vice Provost, Cal Tech
- ~ 2010 Campbell, Colin Oil company geologist
- After 2010 World Energy Council NGO
- ~ 2015 Van der Veer, J. CEO, Shell Oil
- ~ 2037 US DOE, USGS, & US EIA avg. scenario

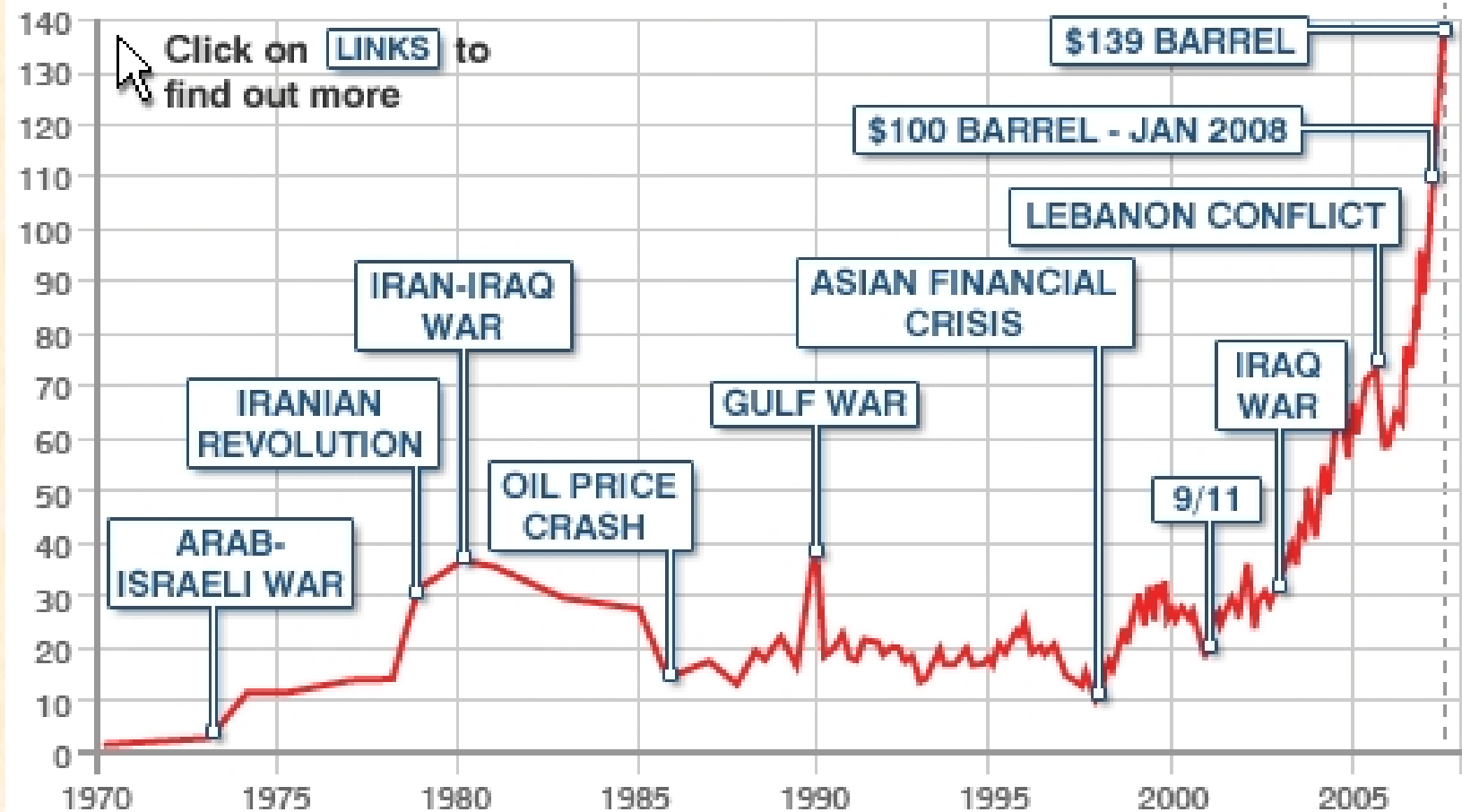
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# Has Oil Depletion Already Begun?

## Escalation of Crude Oil Prices

**CRUDE OIL PRICES 1970-2008**

US\$ per barrel



Figures are not inflation adjusted

SOURCE: BP/Bloomberg

# Impacts of Energy Depletion

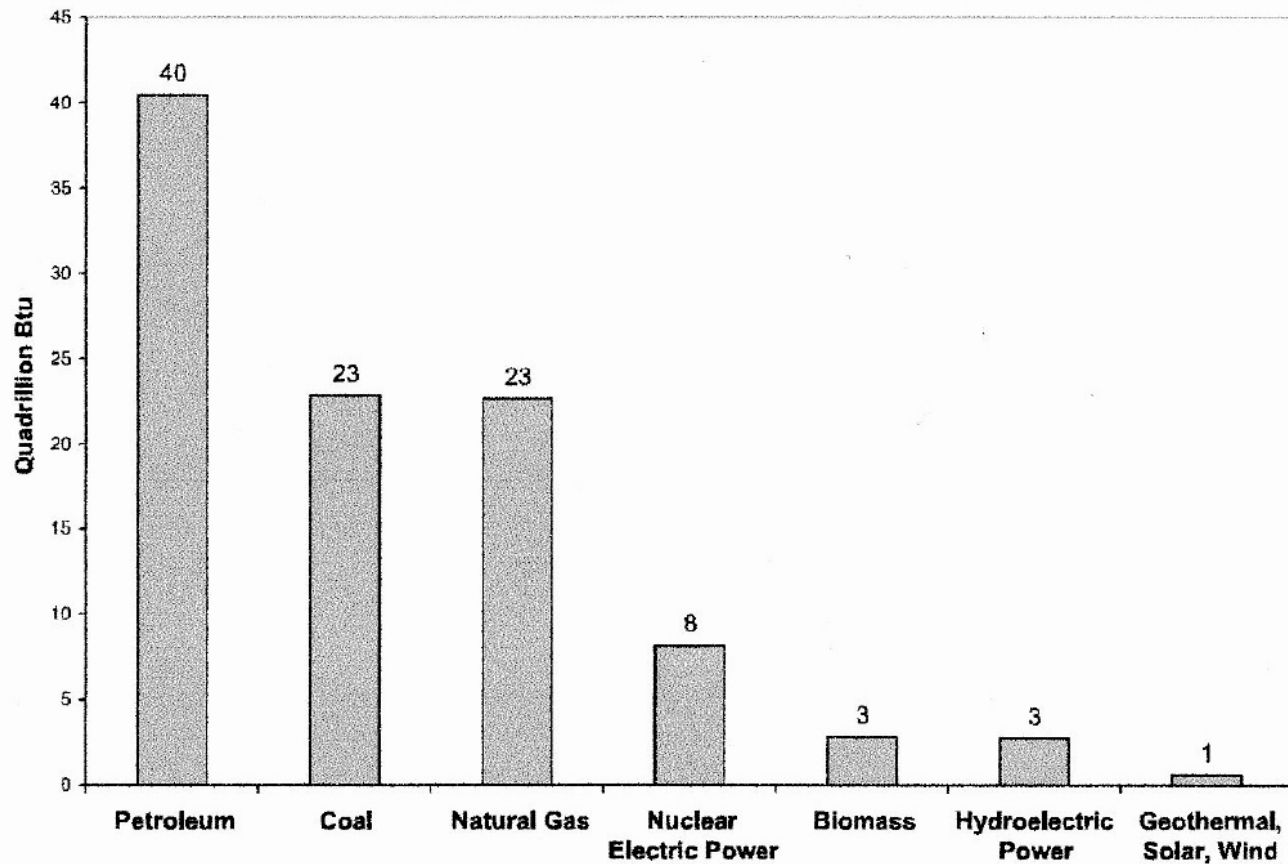
- Economic growth
- Transportation
- Food production
- Distribution of goods
- Maintenance of infrastructure
- Basic services





# US Energy Consumption

**Figure 1: U.S. Primary Energy Consumption by Source, 2005**



Source: Energy Information Administration (EIA), *Annual Energy Review 2005*.

# Do We Have A Problem?

Peak oil means both increased oil prices and volatility in supply.

Why is this a problem for local governments ?

- Dependence on oil
- Short-term challenges
- Ongoing challenges

## High price of asphalt puts brakes on paving projects



Workers pave part of Interstate 40 in downtown Knoxville in this July 2001 photo. The high price of asphalt means state and local governments are pursuing fewer road projects these days. Bruce Wuestrich, senior director of engineering and public works for Knox County, said the county has not had to sacrifice capital projects — the building of new roads or major reconstruction projects that generally cost more than \$50,000. Instead, it has scaled back maintenance projects in subdivisions.

County hasn't quit new roads but halts maintenance work

BY ANDREW EDER  
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When Knox County awarded a bid for a road-resurfacing project near the beginning of the year, the price of asphalt was holding steady after a post-Hurricane Katrina spike. But by the time paving began two months later, the project cost shot up about 40 percent.

It turned out to be 20 miles of road that

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- Take a virtual tour of an asphalt plant
- See a detailed table and chart of historical asphalt prices

ects that generally cost more than \$50,000. Instead, it has scaled back maintenance projects in subdivisions. The 20 miles of road cut from the paving list were all residential, he noted.

### DID YOU KNOW?

Asphalt cement is a dark, viscous material found in crude petroleum. The cement is separated out in the oil refining process and transported to a plant near the paving site. Asphalt cement is mixed with hard material called aggregate to form asphalt concrete, also called blacktop. Asphalt pavement consists of a surface layer of asphalt concrete.

# Dependency on Oil by US Economic Sector

- **Transportation**
  - fuels
  - roads
- **Agriculture**
  - fertilizers, pesticides
  - machinery
- **Materials**
  - plastics
  - chemicals
- **Manufacturing**

# Short-term Challenges

**Abrupt disruption in oil imports**

**Economic emergency with implementation of disaster plans:**

- Fuel reserves & rationing
- Alternative fuels and transport modalities
- Transportation of vital commodities
- Transportation of workforce



# Ongoing Challenges

## Gradual decline in energy resources

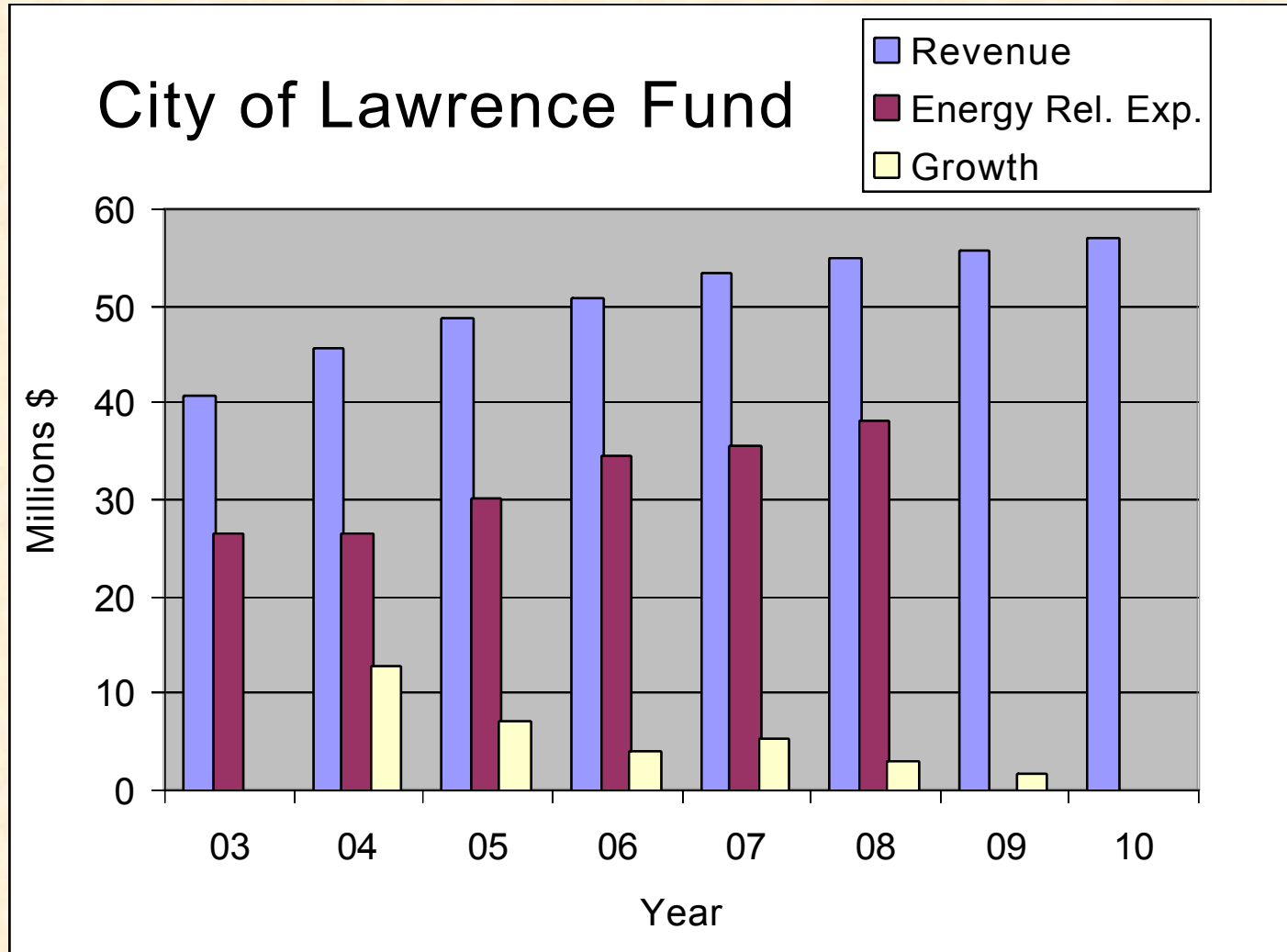
- Economy - 2 –5 % annual decline in petroleum production = decline in GDP, inflation & unemployment
- Municipal Planning
  - Setting meaningful budgets
  - Land use and transportation
  - Serving citizens and the business community

**It's local government that has the job of looking out for citizens' interests on a day-to-day basis... Threats of major disruption of our oil supply, or skyrocketing costs for fuel, are direct threats to our communities. We have to respond. We can't wait for leadership from Washington.**

**- Councilmember Rex Burkholder,  
Metro (regional government),  
Portland, Oregon**



# Financial Deficit from Energy Depletion



# What can Lawrence do ?

## Ten government mitigation initiatives to secure our energy future

1. Reduce total oil & natural gas consumption by 50% over next 20 years
2. Educate public about peak oil to foster community based solutions
3. Engage business, government & community leaders to initiate planning & policy change

# Mitigation Initiatives

4. Preserve farmland and expand local food production and processing
5. Revise land use code to support solar & wind energy, urban agriculture, transit oriented development, etc.
6. Expand urban transport options - upgrade rail systems, promote walkability, transit, bicycle facilities, and multi-modal streets
7. Adopt energy efficient building programs & incentives for all new and existing structures

## Mitigation Initiatives

8. Encourage business sustainability opportunities for green jobs including tax incentives
9. Redesign the safety net and protect vulnerable and marginalized citizenry
10. Establish Emergency Management Office response plans for sudden and severe shortages

# Initial Steps to Mitigation

- Adopt a Lawrence Peak Oil Resolution
- Establish a Peak Oil Task Force
- Sign the Oil Depletion Protocol
- Adopt the Mayors Climate Protection Agreement – ACHIEVEMENT
- Join ICLEI's Cities Climate Protection Campaign – ACHIEVEMENT

