

# Alternative Fuels: The Pros & Cons



*Alternative Fuels to the Rescue*

ETCFC.ORG

EAST  
TENNESSEE  
CLEAN FUELS  
COALITION

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[www.ETCFC.org](http://www.ETCFC.org)



# Today's Agenda

- 1 - All Alt fuels – Pros & Cons
- 2 - Specific alt fuels – Pros & Cons
- 3 - Economics – Real Cost of Petroleum
- 4 - Examples of East Tennessee Alt Fuel Fleets
- 5 - Financial Assistance Options



## AF101 - What are the alternative fuels, and what are “Alternative Fuel Vehicles?”

- Fuels: Cleaner Burning Alternatives to Petroleum
  - Biodiesel (B20 & B100)
  - Electricity
  - Ethanol (E85)
  - Hydrogen [long-term fuel of choice]
  - Natural Gas (CNG/LNG)
  - Propane (LPG)
- AFVs: Vehicles that can utilize these fuels

*Hybrid Electric Vehicles (HEVs) –  
another form of AFV!*



# All Alternative Fuels – Benefits #1

- Reducing transportation-based air pollution (localized pollutants and CO<sub>2</sub>)
- **Reduced oil dependence = increased national security**
- Helping move America to more diversity in using fuels and flexibility in offering fuels
- **Put \$\$\$ back in America; reducing the financing of terrorists**





## All Alternative Fuels – Benefits #2

- Vehicles and equipment should last longer
- **Using biofuels moves to more sustainable choices**
- Do you want to see petroleum further subsidized or do you want to see *your money* go to support the fuels that we want to carry us beyond 2050? (*Explain – playing field, create demand*)

Only two options: 1) stop subsidizing petroleum, or 2) subsidize the alternatives. *Important addendum – the more we use the alt fuels and help them reach a critical mass for use, the better chance they have of competing without needing that subsidy.*

Demand for alternatives help develop the businesses that are needed to produce them and the technology that can help advance them



# All Alternative Fuels – Negatives #1

- Most alternative fuels will yield reduced fuel economy (except biodiesel), thus they need to cost less than gasoline or diesel to be (energy equivalent) cost competitive
- Almost all require some level of added expense for infrastructure (i.e., cleaning, new components, completely new tank and pumps)
- Likely that the alternatives will not be profit makers at the onset
- Some alt fuels requires whole new vehicle, or require a conversion (biodiesel doesn't, ethanol doesn't have to)
- Can't be run through existing pipelines
- No alternative fuel is a silver bullet;  
ALL have their warts





## Biodiesel – Pros & Cons



### PROS

- Cost competitive most of the time (with federal subsidy)
- Is the only alt fuel that can yield increased economy *and* power
- No new vehicles or infrastructure required
- Fill-n-go option at B20 or less
- Renewable; helps farmers
- Less smoke, smell and noise
- Biodegradable; nontoxic
- Helps equipment last longer; less wear and tear



### CONS

- Can require fuel filter changes at the onset of usage (easy)
- Gels faster than diesel, so precautions must be taken during wintertime use (easy)



## Ethanol – Pros & Cons



### PROS

- Cost competitive most of the time
- Easy to use and handle; any gasoline vehicle can take E10
- With LD market in U.S. heavily leaning toward gas, is alternative option for that market (one of the few countries so heavy on gas)
- Renewable; helps farmers; cellulosic opportunity is huge
- Availability of FFVs growing (GM offers 17 models in '07!)
- FFVs are affordable, typically costing no more than a gas version
- Higher octane = more power; E85 is typically 100-105

### CONS

- Higher blend requires vehicle capable of handling that level of alcohol (silver lining – can adjust non FFV to run on only E85)
- Infrastructure may need some parts replacement, or may have to use new equipment



## NG & LPG – Pros & Cons



### PROS

- Even today, can cost same as or significantly less than gas/diesel
- Cleanest alt fuels on the market
- Can have bi-fuel/dual fuel setup; offers flexibility
- LPG – Most widely used alt fuel internationally; well known
- NG – Can be renewably sourced; can be blended with H<sub>2</sub>
- *Now there is an ET-based conversion company!*

### CONS

- Require new tanks and pumps; NG most expensive
- In many cases, require vehicle conversion or new vehicle
- NG – utility sector is blasting through domestic NG supplies



# Economics – Real Cost of Petroleum

## What does petroleum cost?

- tax subsidization/undertaxation of the oil industry
- Government program subsidies
- Protection of oil shipments and motor vehicle services
- Environmental, health and social costs
- Other externalities
- GRAND TOTAL = \$5-15 / gallon

*<http://www.distributiondrive.com/Article4.html>*



## The ETCFC - Participants

- Cities//Counties: Maryville, Alcoa, Sevierville, Gatlinburg, Knoxville, Athens, Chattanooga // Sevier, Blount, Knox, Anderson, Washington Hawkins, Hamilton,
- State officials: *Just about all of them now – EO #33!*
- Fuel Providers: SCUD, TVA, KUB, McNutt Oil, Calloway Oil, Benton Oil, Regal Fuels, Tri-Cities Petroleum, Pioneer Oil, Pilot, AmeriGas
- Fleets: Alcoa Inc., Eastman, KAT, CARTA, ORNL, Fun Buggies, GSMNP, KUB, sawmills, TN Valley Marble
- Research & University-based: ORNL, EERC, ATTI
- Others: GSMNP, Big South Fork NRRA, IdleAire, Fun Buggies, McGhee-Tyson Airport, state parks, individuals



# Regional Fleets - Biodiesel





# Regional Fleets - Ethanol





U.S. Department of  
Energy

# Regional Fleets – CNG & LPG





# Regional Fleets – Electric/Hybrid Electric





## Potential Financial Assistance for Projects/Purchases

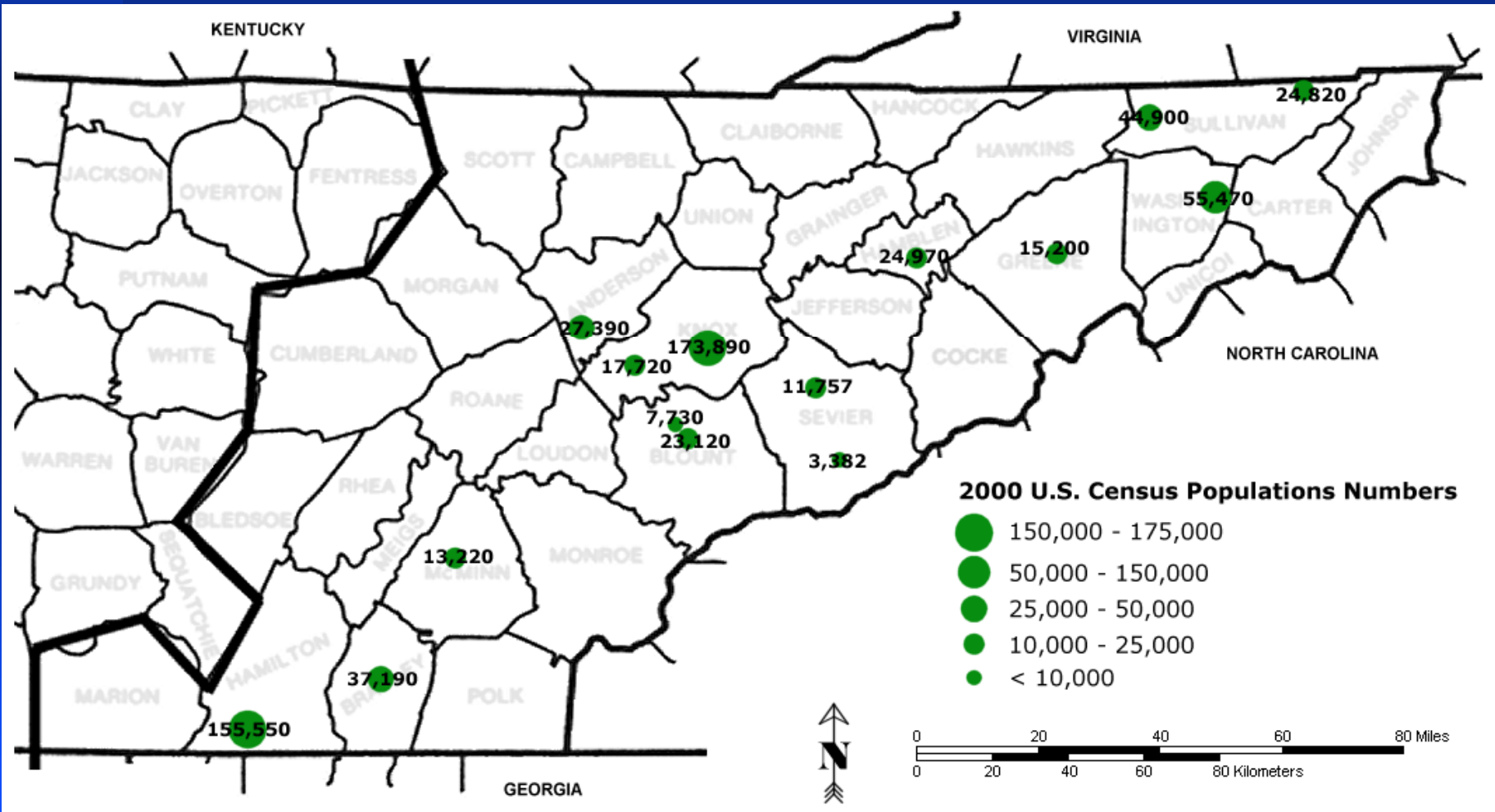
- State Energy Program funding (SEP annual opp.)
- Transportation Energy Partnership funding
- Fed. Dept. of Agriculture funding (biorefinery)
- **TDOT public E85/B20 funding**
- SEO county/city biodiesel funding
- CMAQ Program (nonattainment areas)
- Options through AFVs producers (GM, et al.)





# Biodiesel Explosion in East Tennessee (cont.)

*Examples of Action -- Cities in East TN*





*Live the World a Better Place  
than You Found It!*

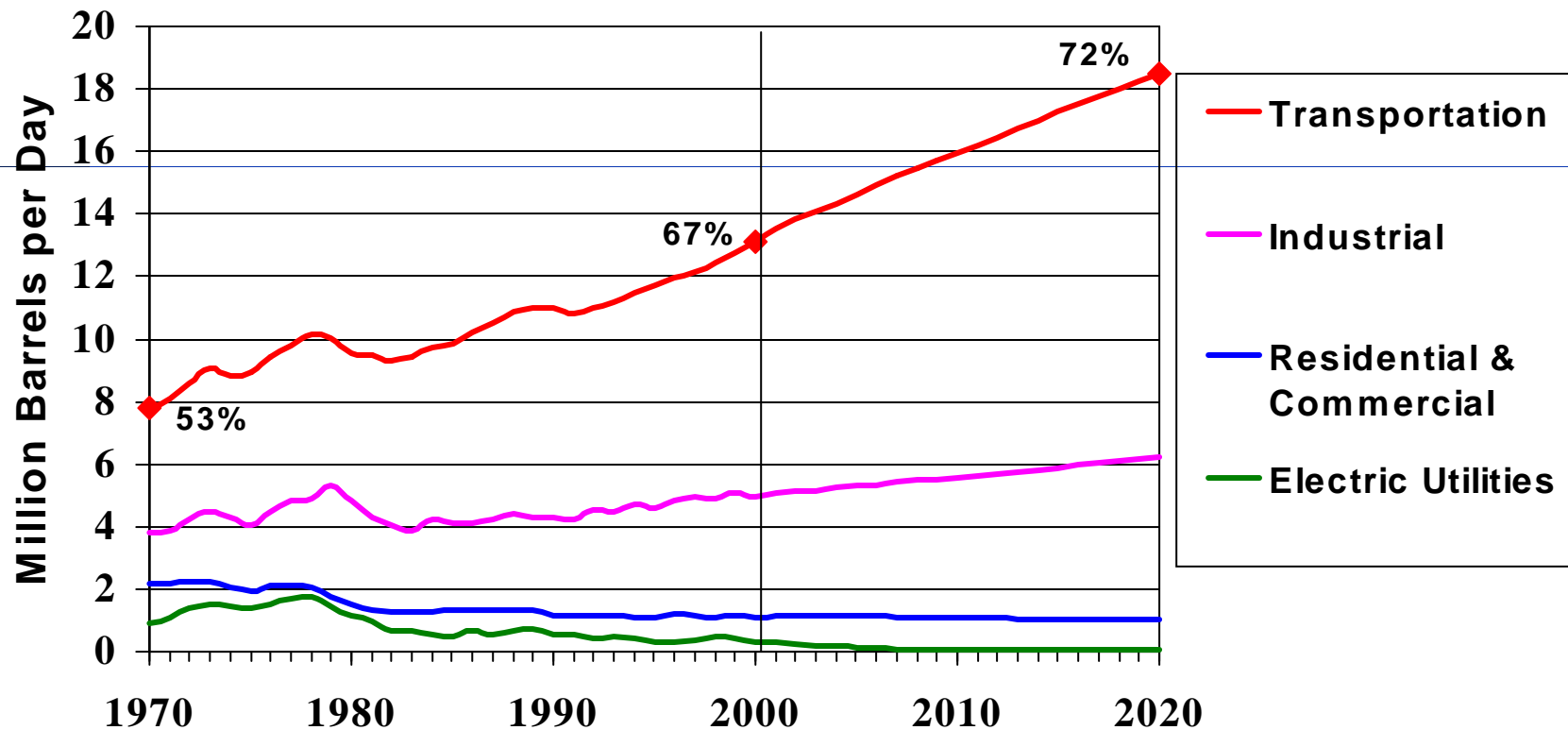
**Your Link to Alternative Fuels  
in East Tennessee:**

*[www.ETCFC.org](http://www.ETCFC.org) / (865) 974-3625*

**Questions?**



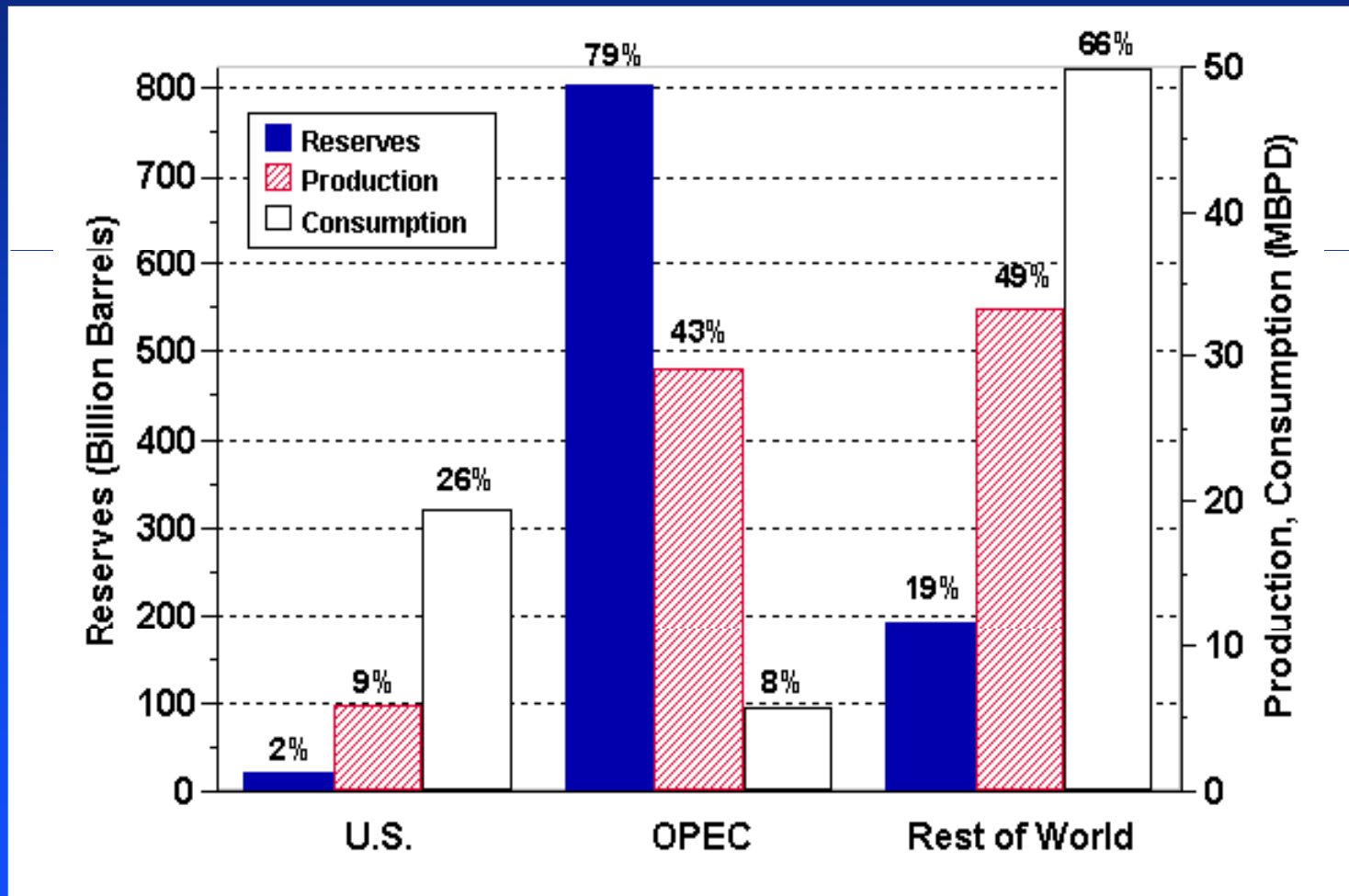
**Transportation sector is almost entirely dependent on oil; it accounts for ~68% of U.S. oil use now, and will increase significantly in the future.**



Source: 1949-1999, EIA, *Annual Energy Review*; 2000-2020, EIA *Annual Energy Outlook 2001*



# National Energy Dependence/Security - the Balance is Tilted Against Us

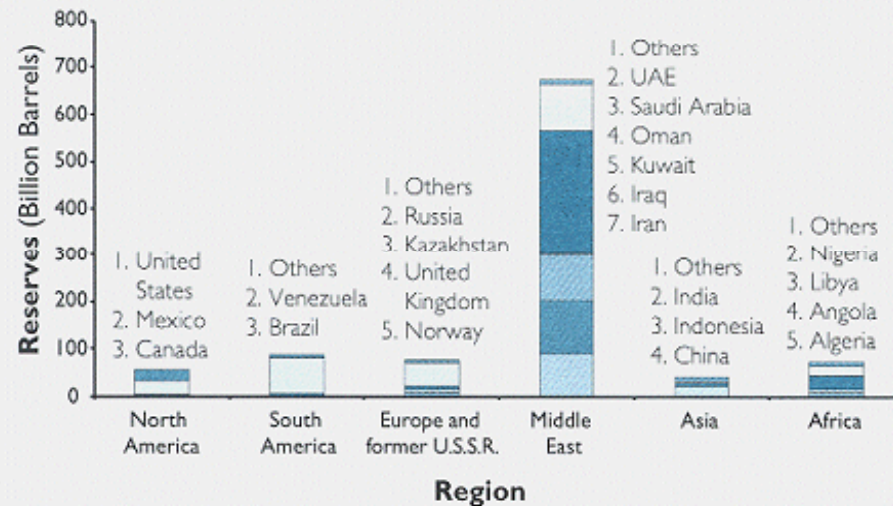


*In 2000, the U.S. contains about 4.5% of the world's population.*



...long-term data tells us that if we don't start curbing our addiction, we will be buying that oil from the Middle East.

FIGURE 2: CRUDE OIL RESERVES BY REGION AS OF JANUARY 1999



Note: Countries included within each column are listed at the top of that column. Countries whose reserves were less than 5 billion barrels were placed in "Others." The world's total reserves are roughly 1 trillion barrels.

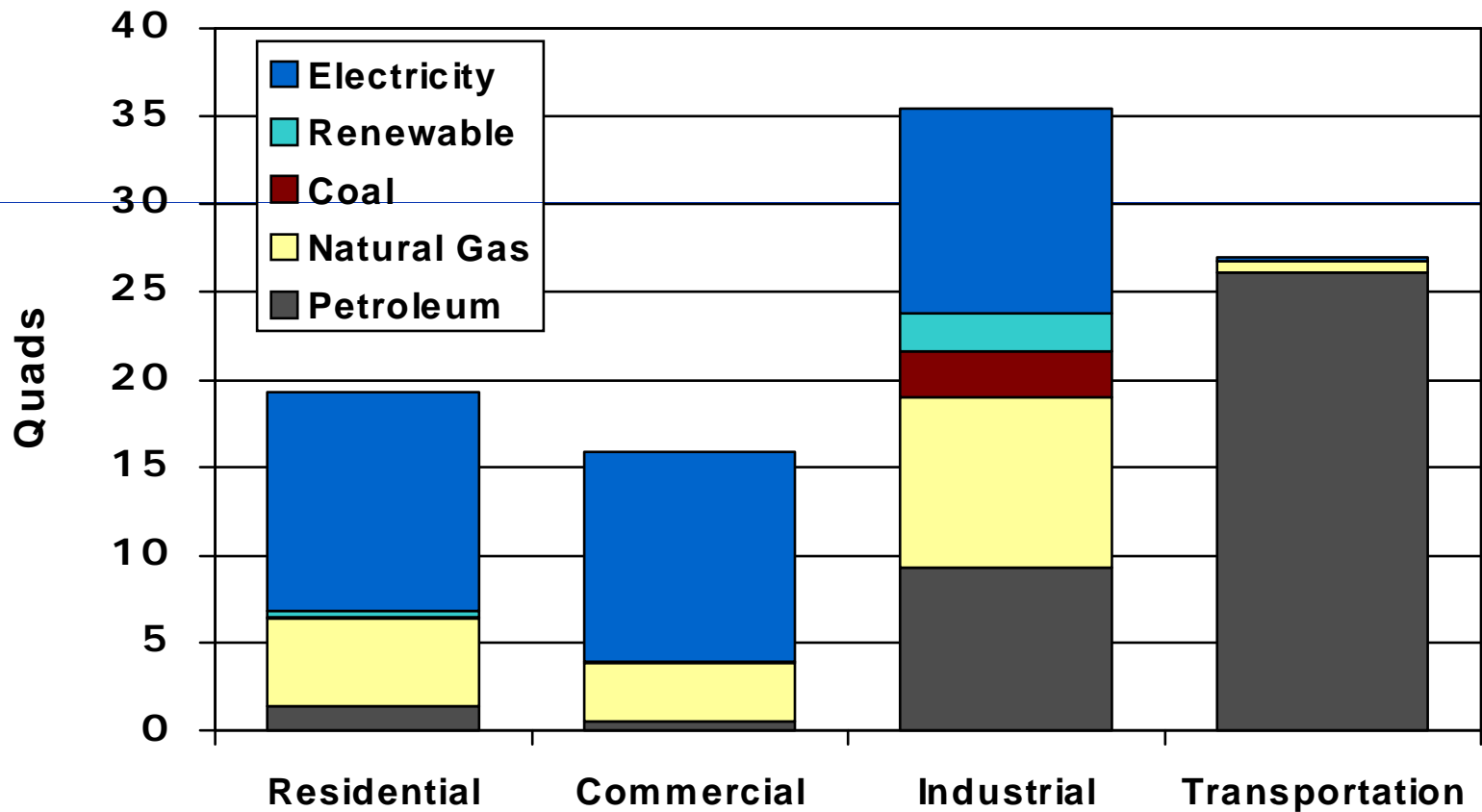
Source: USDOE, Energy Information Administration, International Energy Annual 1999, Table 8.1

Fig. 2 Percentage Breakdown  
(numbers approximated from Figure 2)

Region	(Bil. Bbl)	(%)
North Am	55	5.1%
South Am	100	9.3%
Europe/USSR	95	8.8%
Middle East	700	64.8%
Asia	40	3.7%
Africa	90	8.3%
TOTAL	1,080	100.0%



# Fuel Use Within Sectors: Diversity, or Lack Thereof



*Graph courtesy of the Central Ohio Clean Fuels Coalition (COCFC)*

