Finding The Right Balance

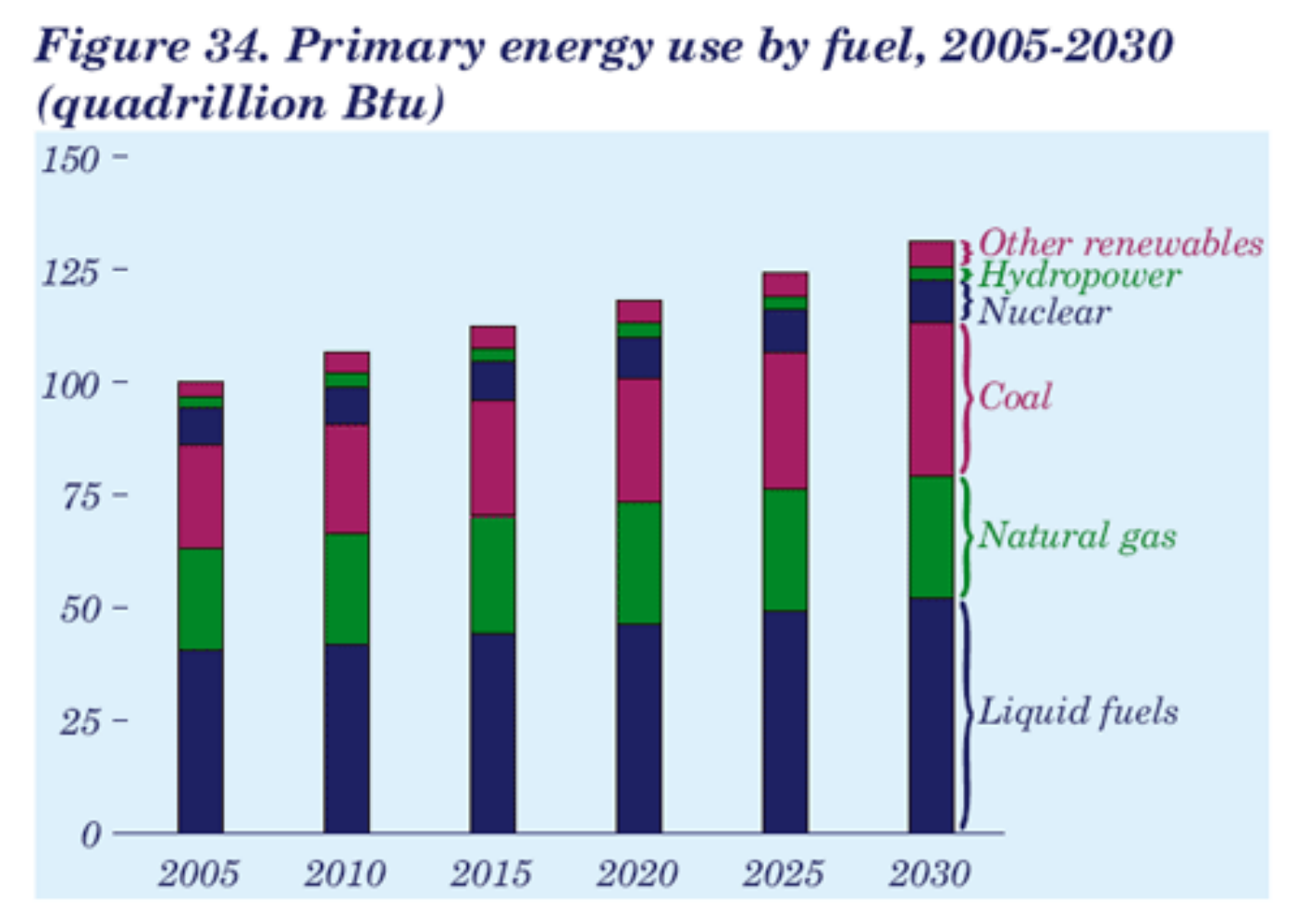
U.S. Energy Supply

Jim Sims
Western Business Roundtable

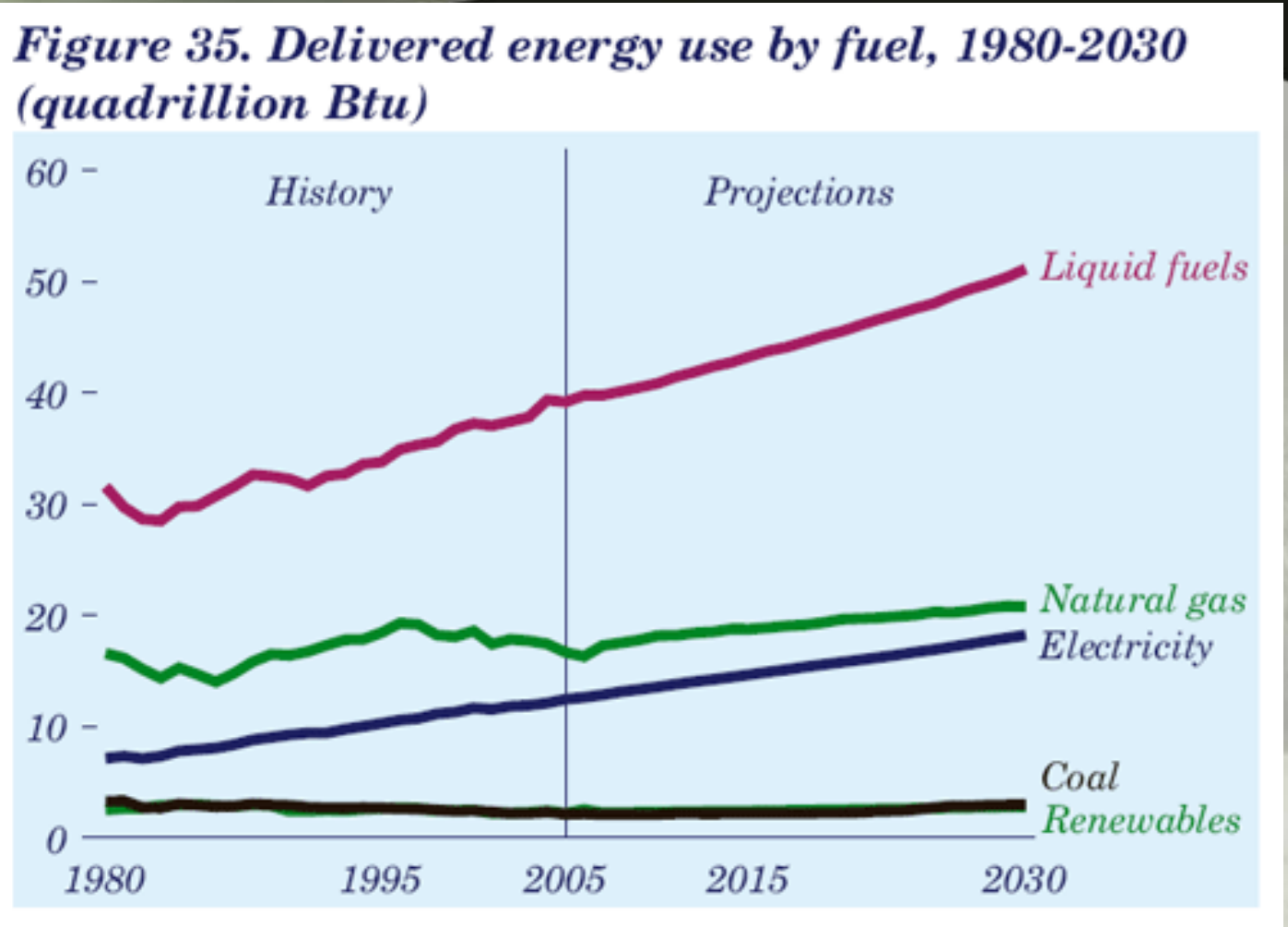
Rules Of Substitution

1. There is on substitute for growing the entire energy “pie”
2. Substituting one resource for another is bad policy
3. Substituting domestic energy for foreign energy is good policy
4. Some substitutions costs consumers more $

The Energy Pie Must Grow

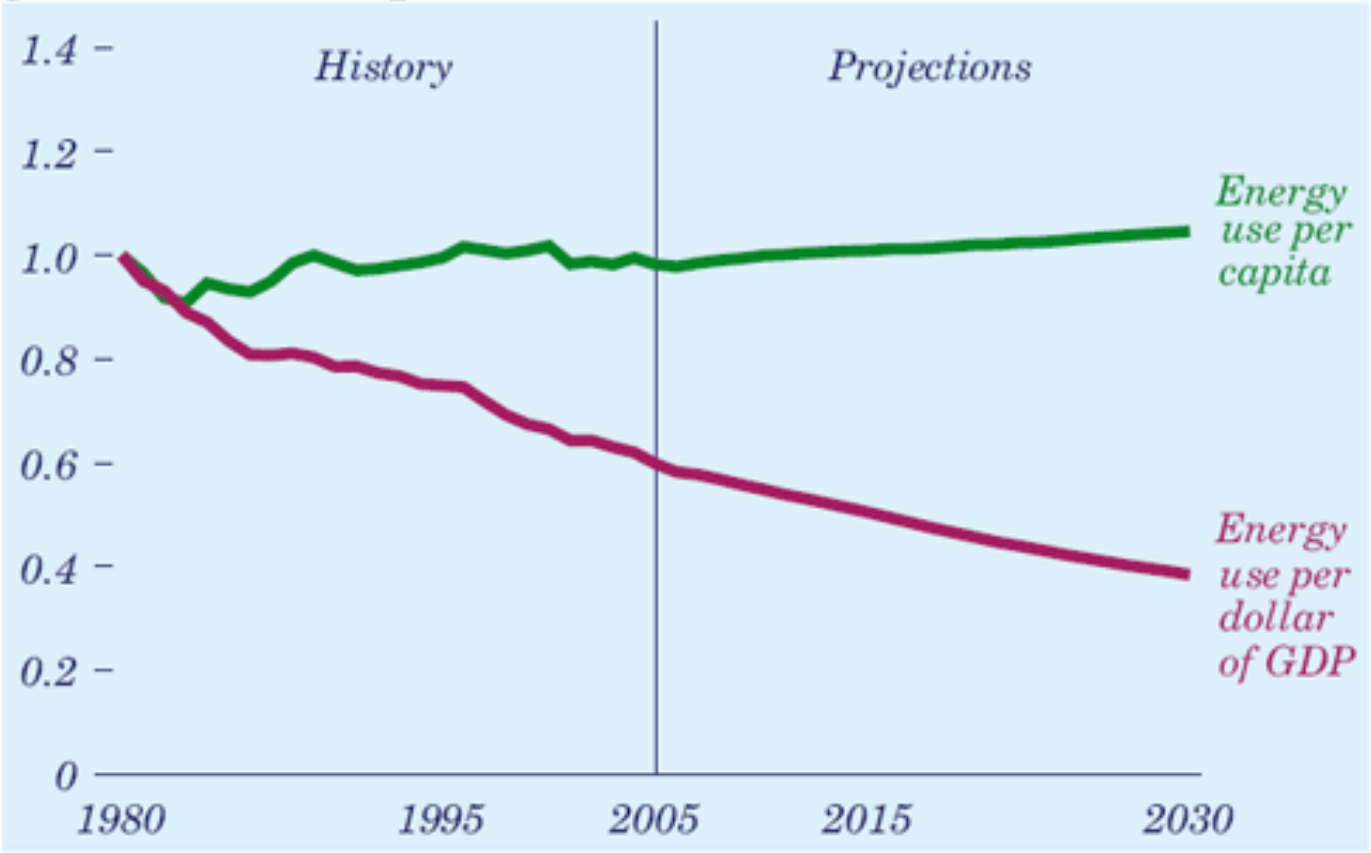


The Energy Pie Must Grow



The Energy Pie Must Grow

Figure 33. Energy use per capita and per dollar of gross domestic product, 1980-2030 (index, 1980 = 1)

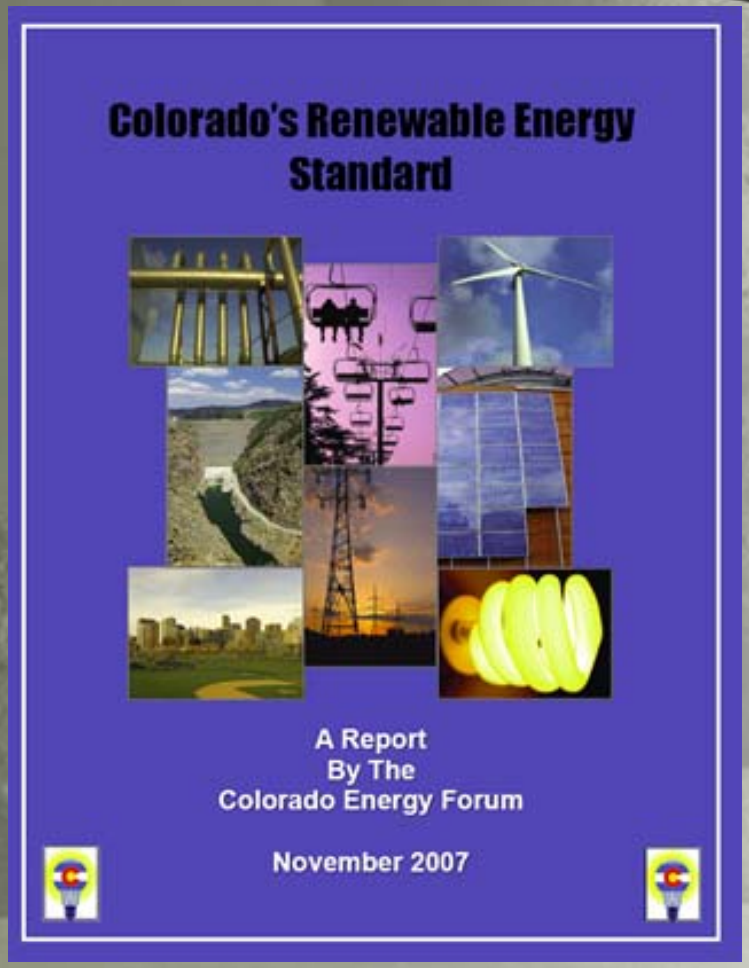


Substitutions That Don’t Work

- Those who say renewables can replace all fossil fuels now are **not telling you the truth**
- Renewables **can’t generate adequate power** to meet our needs
- Renewables **need fossil fuels**

A Case Study

Analysis done by the Colorado Energy Forum in 2007



A Case Study

Colorado will need 4,900 MW from following generation resource types by 2025:

-- 2,280 MW of baseload power

-- 1,540 MW of intermediate power

-- 1,080 MW of peaking power

A Case Study

SCENARIO 1

4,900 megawatts total need

- 980 MW (20% efficiency)
- 980 MW (20% rps)
+ 637 MW (35% capacity factor)

3,577 MW of need beyond efficiency gains / renewables

A Case Study

SCENARIO 2

4,900 megawatts total need

- 1,255 MW (25% efficiency)
- 1,470 MW (30% rps)
+ 956 MW (35% capacity factor)

3,131 MW of need beyond efficiency gains / renewables

A Case Study

SCENARIO 3

4,900 megawatts total need

- 1,470 MW (30% efficiency)
- 2,450 MW (50% rps)
+ 1470 MW (40% capacity factor)

2,450 MW of need beyond efficiency gains / renewables

Renewables Need Fossil

- Intermittent renewables need baseload backup
- Gas power plant cycles hundreds of times in a month to match wind's variability
- Cancellation of Kansas coal plant killed wind development

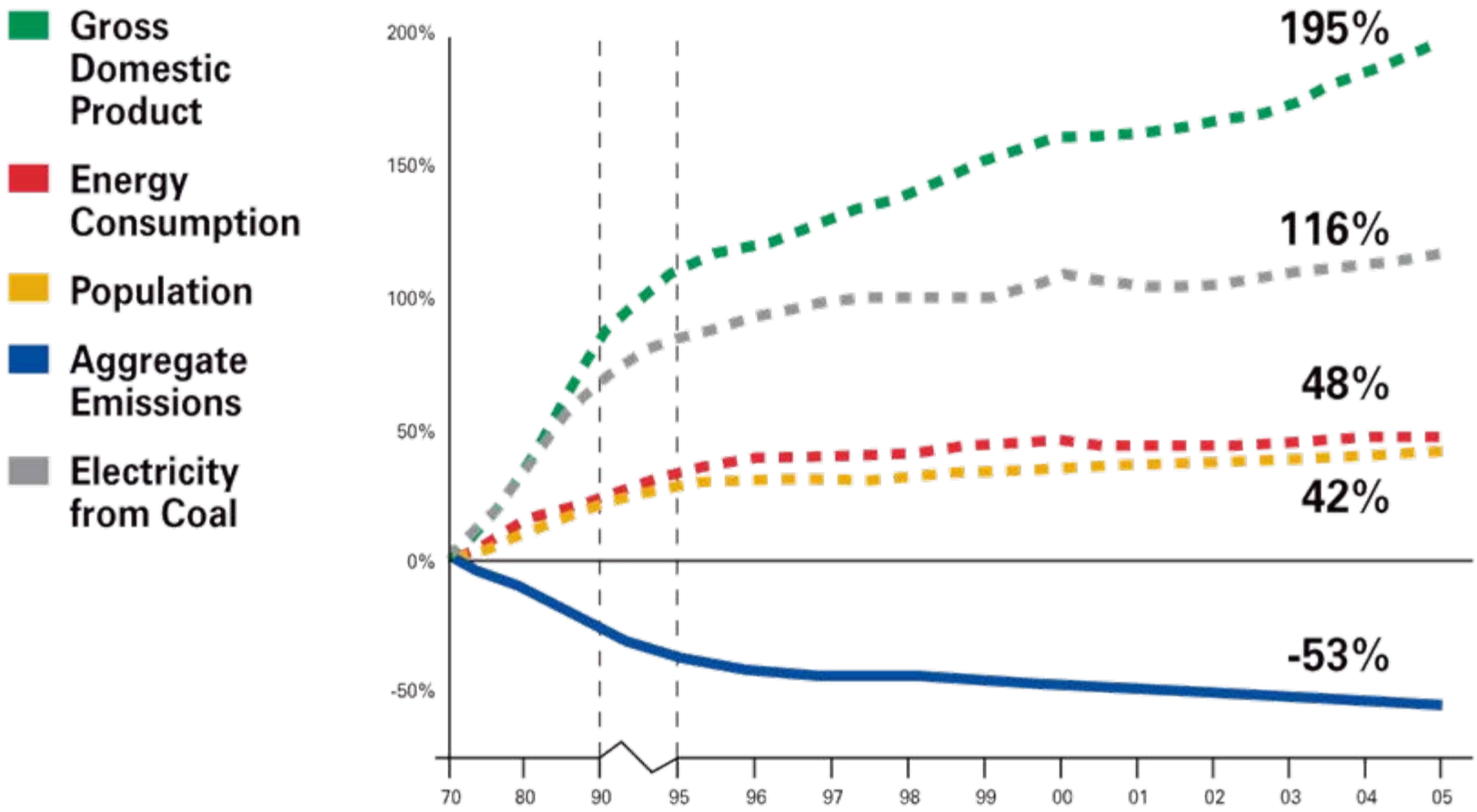
Keeping The Lights On

Dozens of gigawatts that can be met with only 6 things:

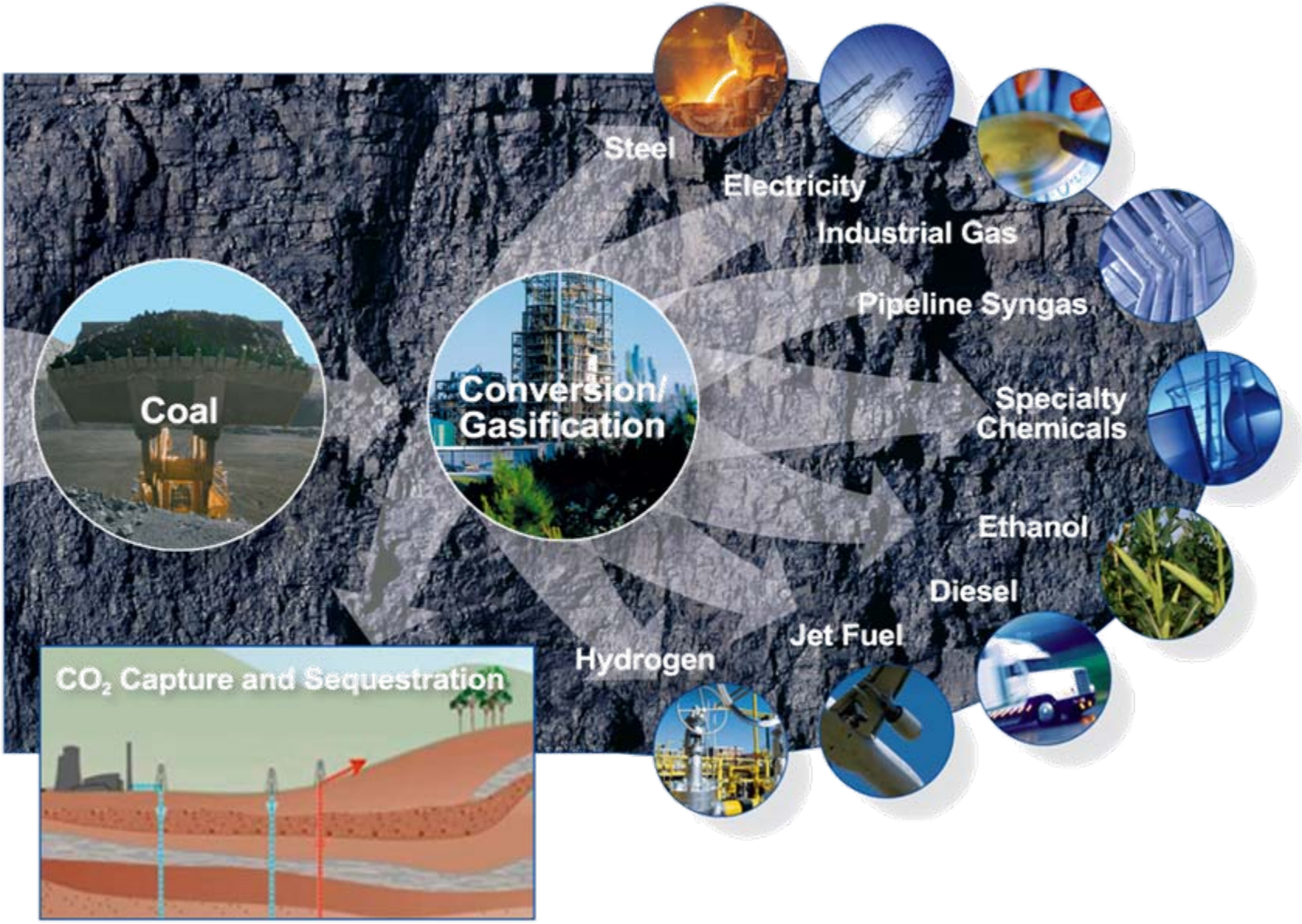
1. Coal
2. Natural Gas
3. ~~Nuclear~~
4. ~~Hydropower~~
5. Imports
6. ~~Negative economic growth~~

Option 1: Coal

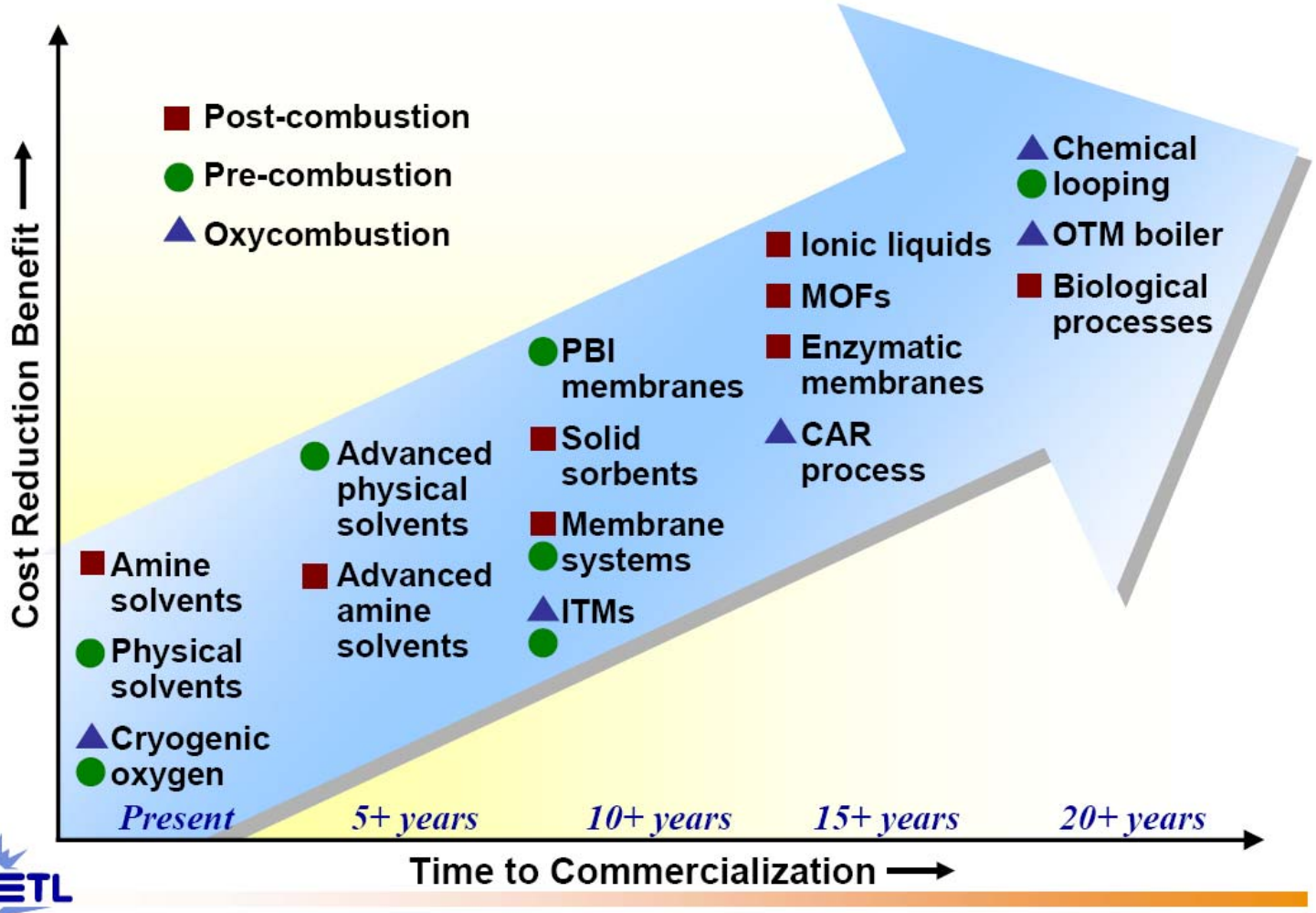
Option 1: Coal



BTU Conversion

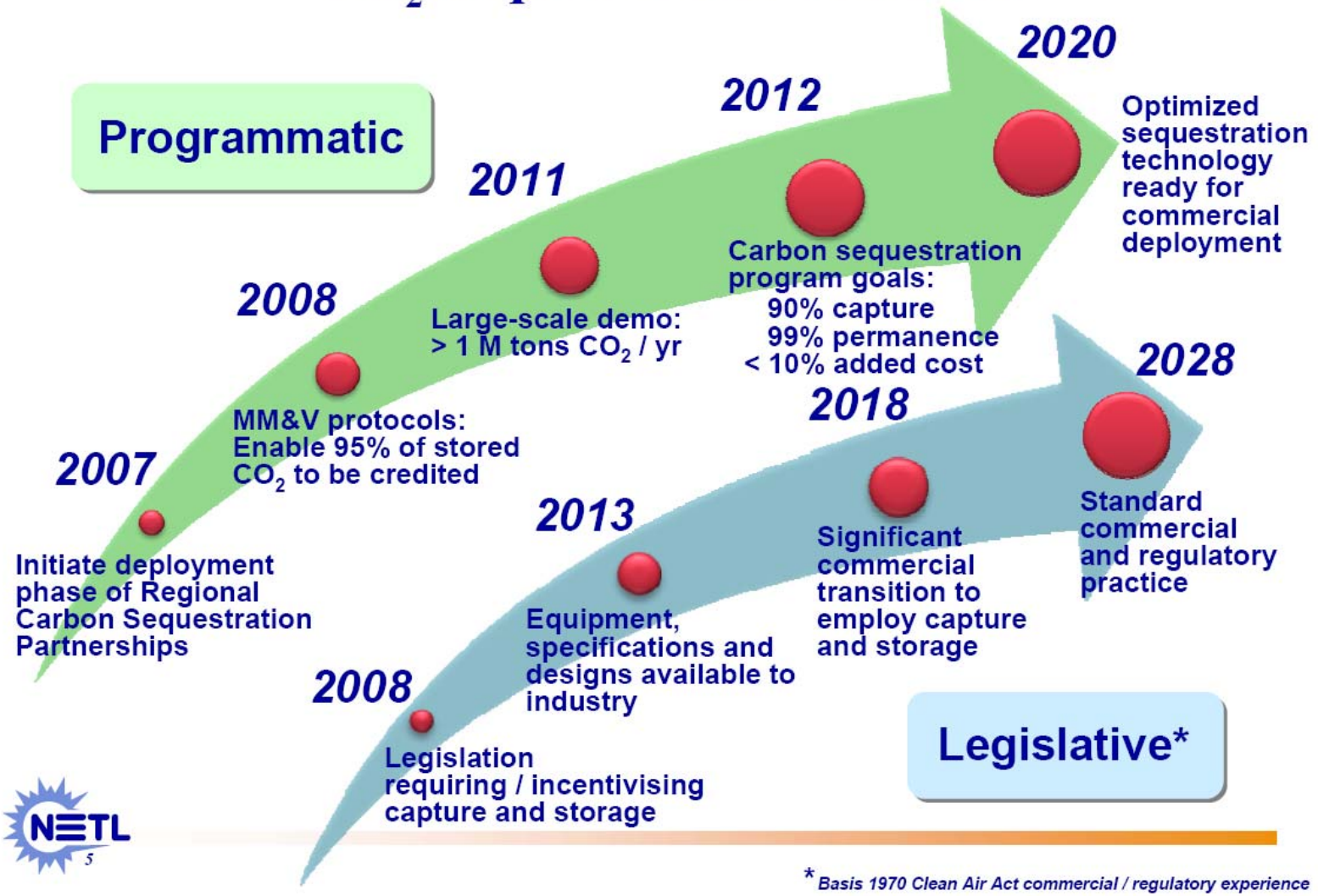


Innovation Advances



Figueroa JD, et al., *Advances in CO_2 Capture Technology—The U.S. Department of Energy's Carbon Sequestration Program, Int. J. Greenhouse Gas Control*, 2007

CO_2 Sequestration Timelines



NETL

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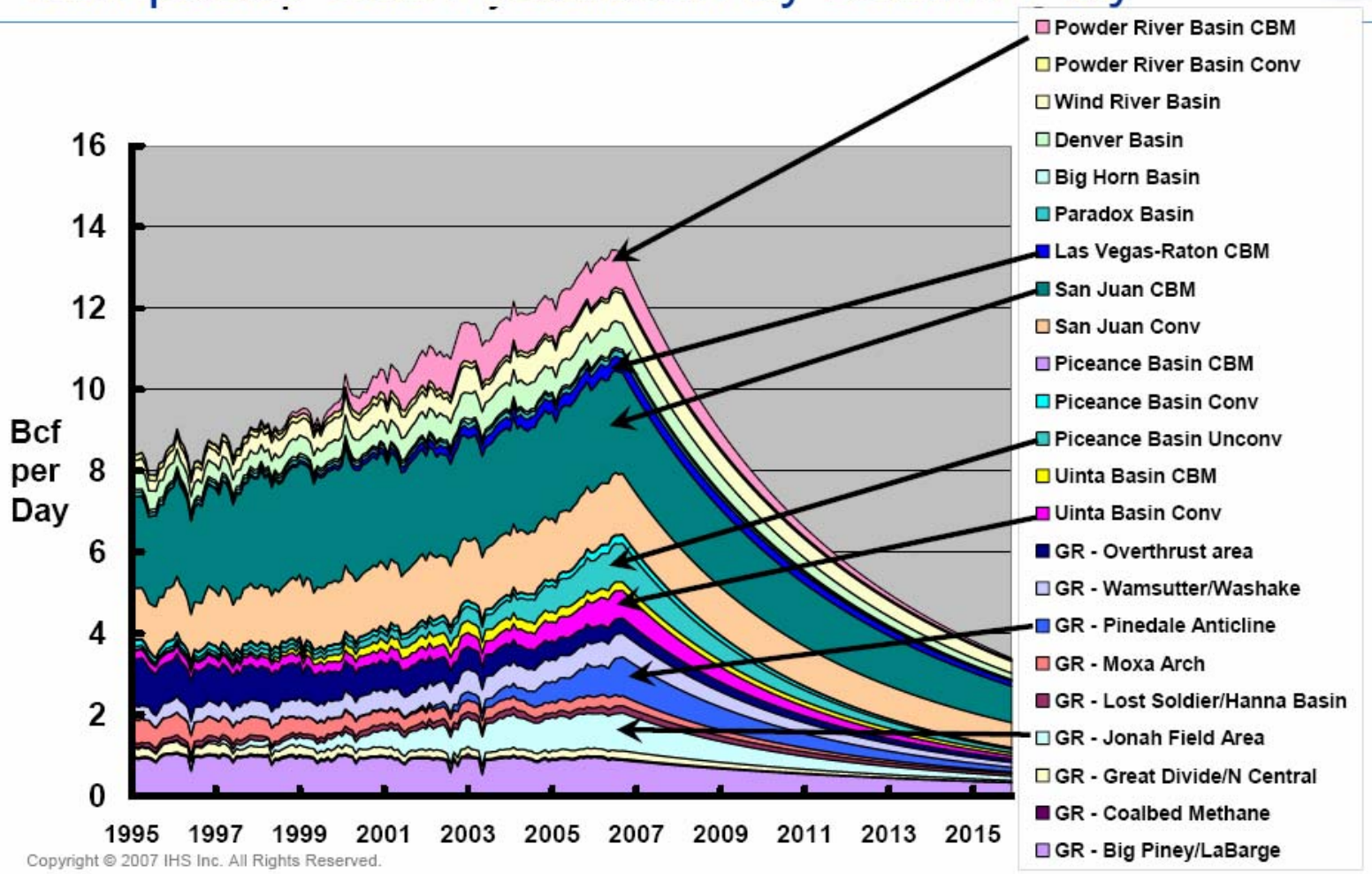
* *Basis 1970 Clean Air Act commercial / regulatory experience*

Option 2: Natural Gas

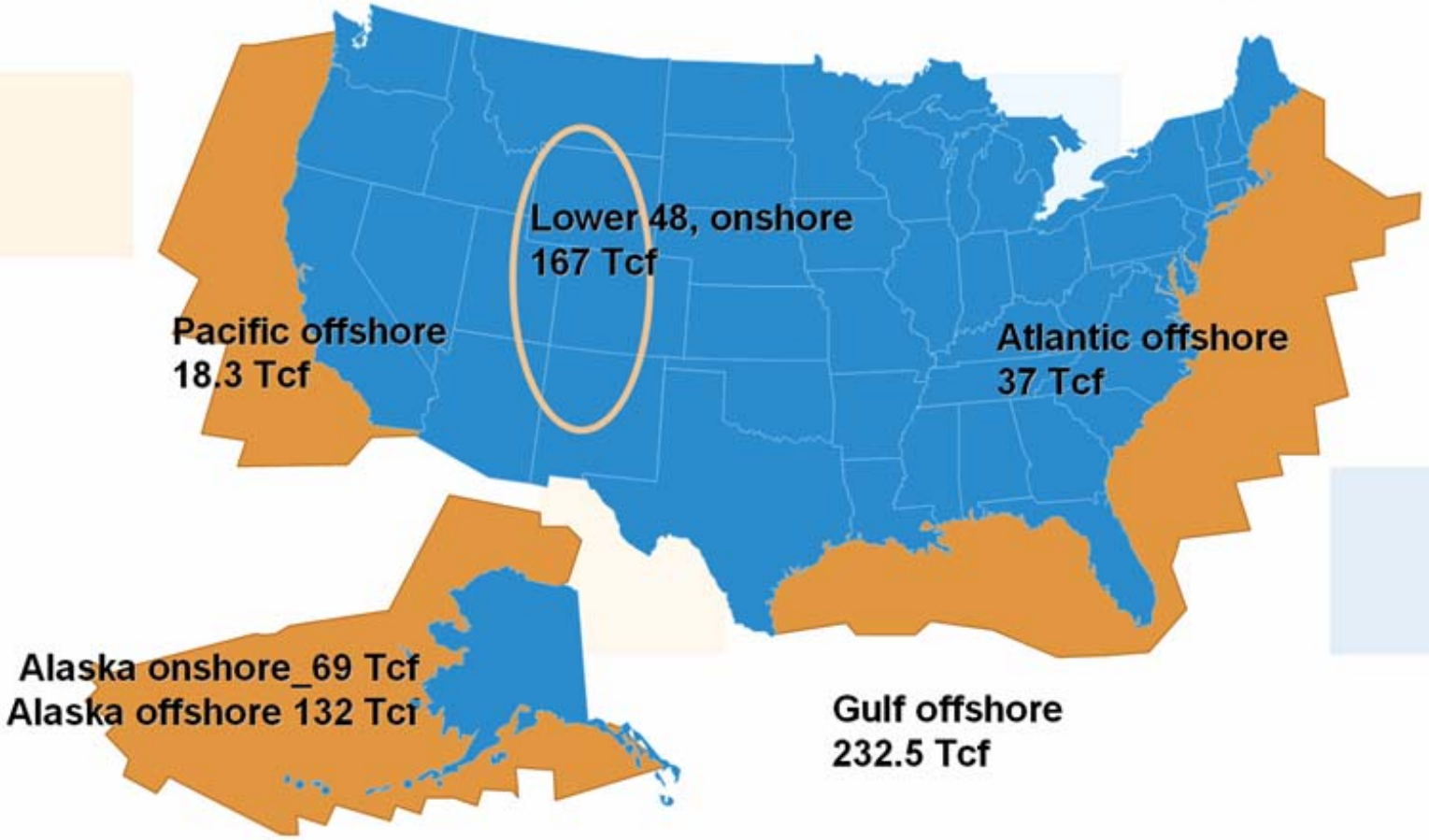
If we want to continue to benefit from natural gas for electricity generation and other uses, we need to continue to drill and produce natural gas.

Rocky Mountain Region
Composite Gas Production by Basin / Play



U.S. Natural Gas Resources

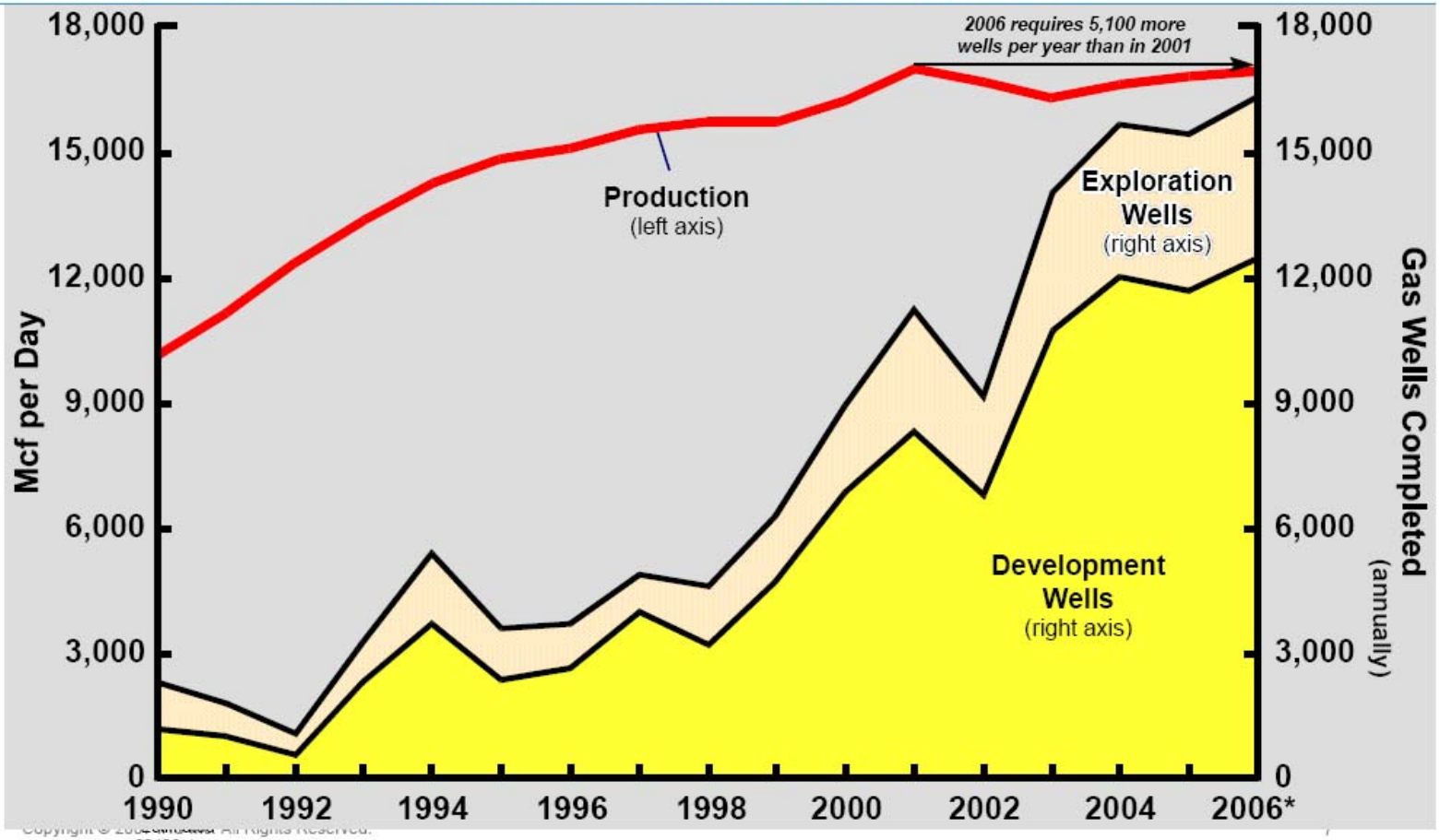
(undiscovered technically recoverable federal resources)



656 trillion cubic feet is enough natural gas to heat 60 million homes for 160 years.

Fighting the Natural Gas Production Treadmill

(Western Canada: North America's largest producing region)



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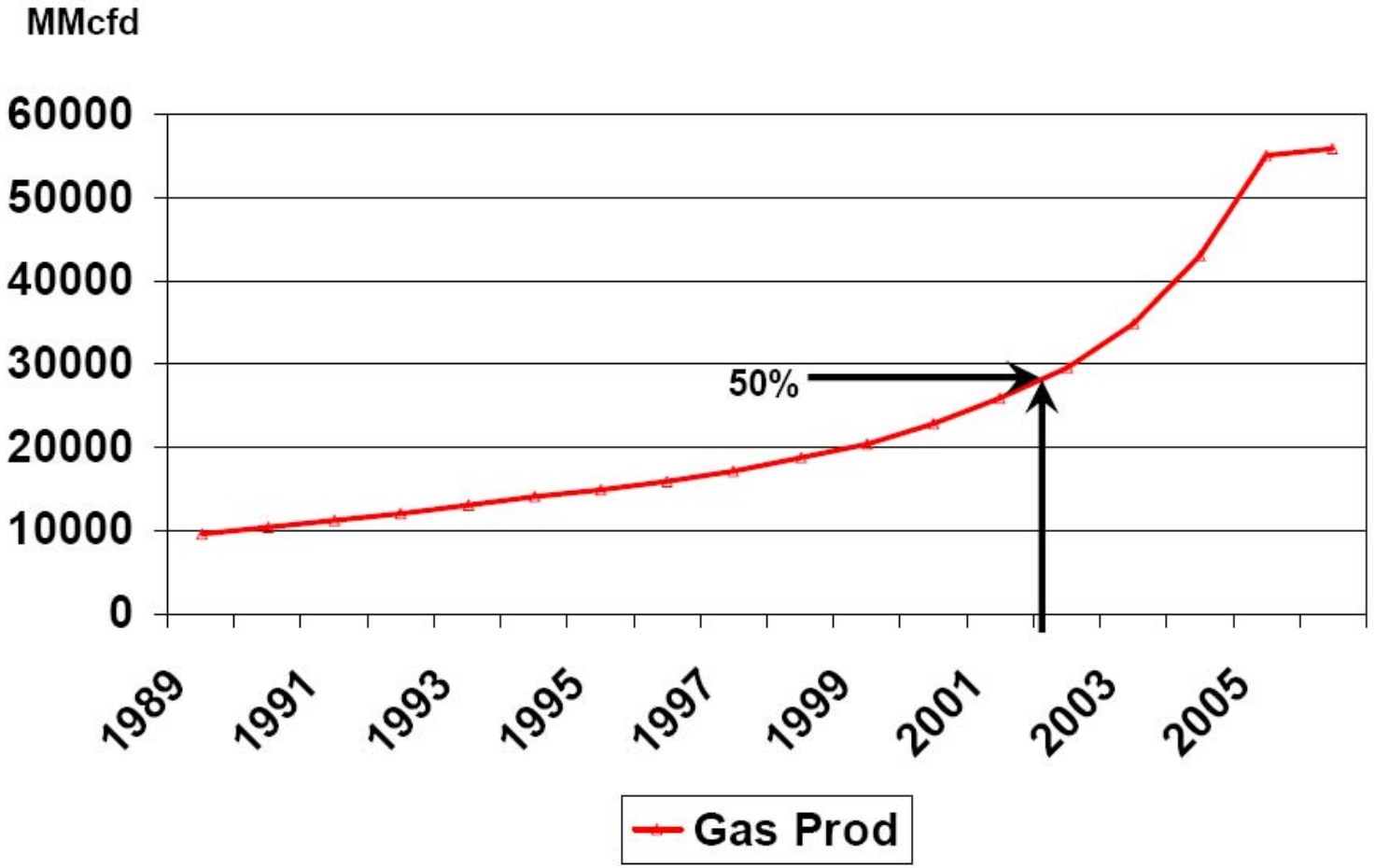
US Vintaged Daily Gas Production Contribution to January 2006 Volume



Option 3: Foreign Energy

Option 3: Foreign Energy

1. As our economy grows, we need more energy from all sources, including the fossil fuels that now meet more than 80 percent of all U.S. energy needs.
2. Discouraging production of American oil and gas forces us to rely more on foreign imports – even assuming a lot more energy conservation.
3. Some of those foreign nations that gladly take our petro-dollars are led by dictators that support foreign terror groups aligned against America.
4. The more petro-dollars we send overseas, the more we indirectly support the very terrorists that our brave men and women in uniform are currently fighting.

Option 3: Foreign Energy

American Energy Substitutes

- American gas → foreign gas
- American oil → foreign oil
- American coal → foreign oil & gas
- American biofuels → foreign oil and gas
- American renewables → foreign gas
- Conservation → foreign oil and gas

Substitutions Cost $$$

Utah Cap-and-Trade Study

	-33% Coal Displacement	-66% Coal Displacement
State output ($2005 Bil.)	-$5.7	-$14.1
H'hold income ($2005 Bil.)	-$2.2	-$5.3
Jobs	-45,800	-111,600

Final Thoughts

Good Substitutions:

Domestic energy ⇔ Foreign energy

Conservation ⇔ Energy use

Low cost options ⇔ High cost options

Final Thoughts

Bad Substitutions:

One resource ⇔ Another

High cost options ⇔ Low cost options

Economic growth ⇔ Conservation

Final Thoughts

Biggest threat:

System reliability and undermining our ability to “keep the lights on”

Final Thoughts

Biggest challenge:

Ensuring that gov't regs don't outpace technological capabilities

Final Thoughts

Moral Imperative:

We must be honest with consumers about the cost increases that are coming, as they will adversely affect low-income families the most

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