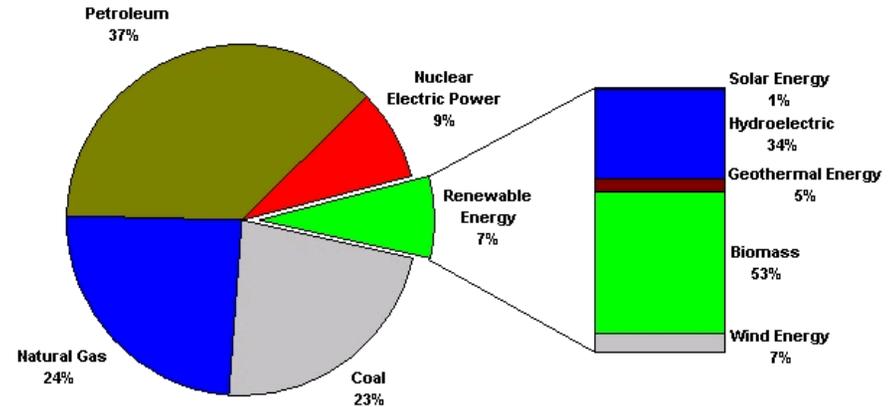


Renewable Energy Storage

- **The Mission:** develop cheap and effective energy storage technology to store renewable energy (RE) for solar and wind energy.
 - Accelerate the integration of RE as practical choices
 - Complement current grid system and move towards energy autonomy in niche area (20% of the total energy market, currently 8%)

- **The Market** for this technology
 - Make RE cost effective and reliable
 - Realize energy autonomy at residential and commercial (only 2.076%)
 - Wind power generation increase rapidly in US (51% increase in 2008)



- **The challenges** for RE storage
 - The cost is not competitive (first priority)
 - The density (both power and energy) are not high enough
 - The scale (size) and flexibility of current storage options

Source	Cost KW/h
Coal	\$0.04
Gas/oil	\$0.08
Wind PV	\$0.12 \$0.25 to 0.5

Storage for Intermittent Energy Sources

- Issue: Energy Demand, Global Warming
 - Need clean (renewable) energy, and lots of it
 - 16 TW additional capacity by 2050 (Nocera, 2009)
 - Most sources are intermittent (solar, wind, wave/tidal, etc.)
 - Will be both centralized (legacy) and distributed
- Storage Need:
 - Bulk storage that can be scaled up/down to meet centralized/distributed storage requirements for intermittent energy generation sources

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