Energy Unit lecture outline & graphics – Fritz Stahr

Tues 1/21/03 - **Transportation of Energy & Energy of Transportation – an intricate link**

- history of settlement & industry largely due to transportation and energy supplies
- initial towns on rivers or by sea where ships could service cargo as water and wind only real power to move goods, people
- early use of hydropower, streams and falls to generate mill power, or wind in Holland
- Fig 62 from Lomborg: indicates wood and hydro initial primary sources of energy until ~1880s then coal, and finally oil takes over in US after ~1925, largely because oil most transportable and denser energy than coal
- McNeill's Coke-town cluster where it is due to ease of access to coal shipped on water (and later rail) and steel shipped out, somewhat true of Mo-town cluster as well
- rail transport developed because steam engine (developed 1769) created way to take significant energy mobile – initially wood burning, but supplies and safety created shift to coal (now old engines left typically burn oil)
- oil generated road system after perfection of internal combustion engine ~1930's – development driven by car/truck culture and public works
- most road expansion post WWII to mid-fifties – now business and culture completely dependent on it
- cities develop/die where highways go/don't…ghost towns on major highways?
- now chicken & egg problem re: which comes first, housing developments or roads – e.g., Samamish plateau in E. King Co.
- 50 M cars registered in 1954, 350M in '89, 500M in '00, but there is "no free road or parking" – Lovins
- firmly entrenched road/car/truck systems in world – $1/7^{th}$ all oil of world consumed on US roads, probably ~1/4 of all used for transport world-wide, therefor big obstacle of future is how to change energy use for transportation

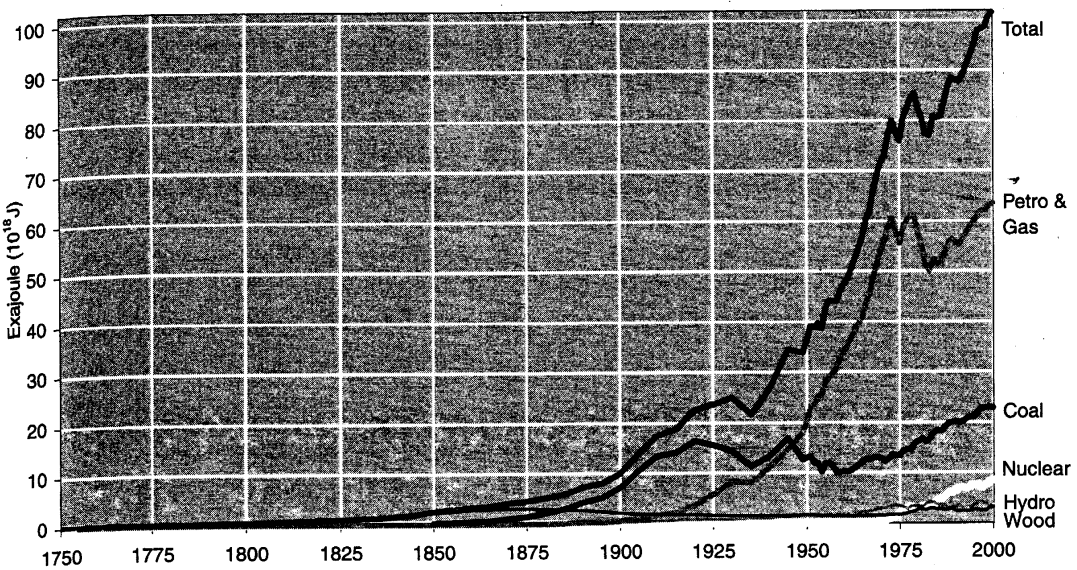

Figure 62 The US energy consumption 1750–2000 of fuel wood, coal, petroleum and gas, hydropower and nuclear power, in exajoule (10^{18} J, approximately 167 million barrels of oil or 37 million tons of coal). Source: EIA 2000d:349–50, 2001a:1.[852]