

# Risks and Nuclear Power

- Jane Long: why we have to take a hard look at nuclear power
- Burton Richter: Risks in Nuclear Power: perception and reality
- Edward Blandford: How we handle nuclear risks now

# "Low-Carb" Fuels + Electricity

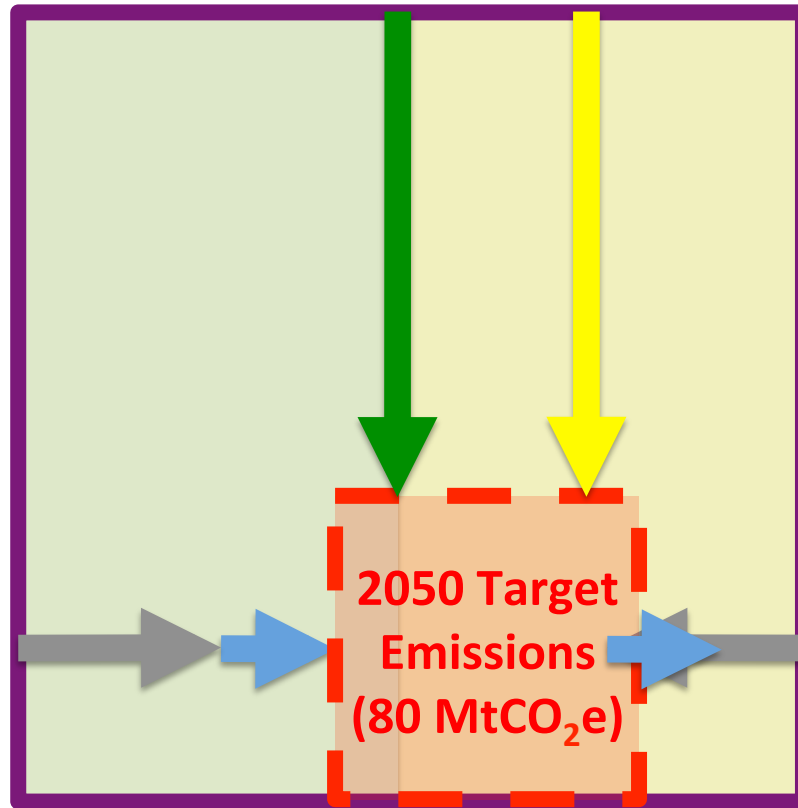


GHG  
Intensity

Electrification



Efficiency



Fuels

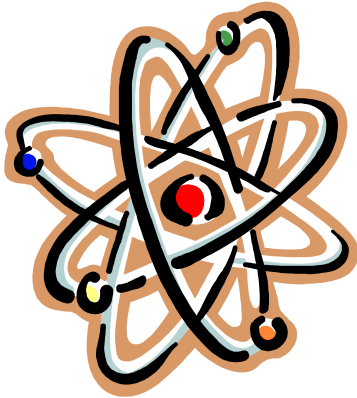
Electricity

Demand

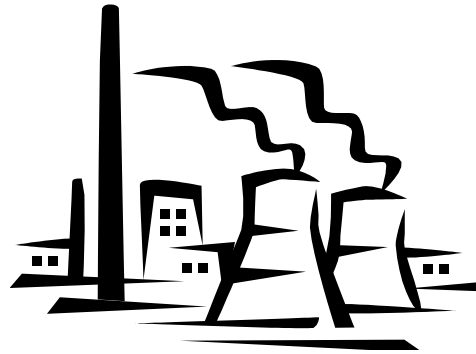
**We will be more or less doubling electricity at the same time we decarbonize this sector**

<b>2005</b>	<b>2050 BAU</b>	<b>2050 High efficiency and electrification</b>
<b>270 TWhr/yr</b>	<b>470 TWhr/yr</b>	<b>510 TWhr/yr</b>

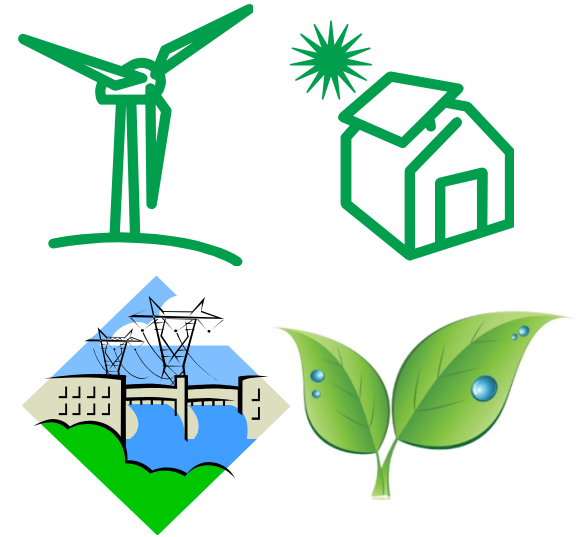
# There are 3 Low-Carbon Electricity Options



**Nuclear**



**Fossil/CCS**



**Renewables**

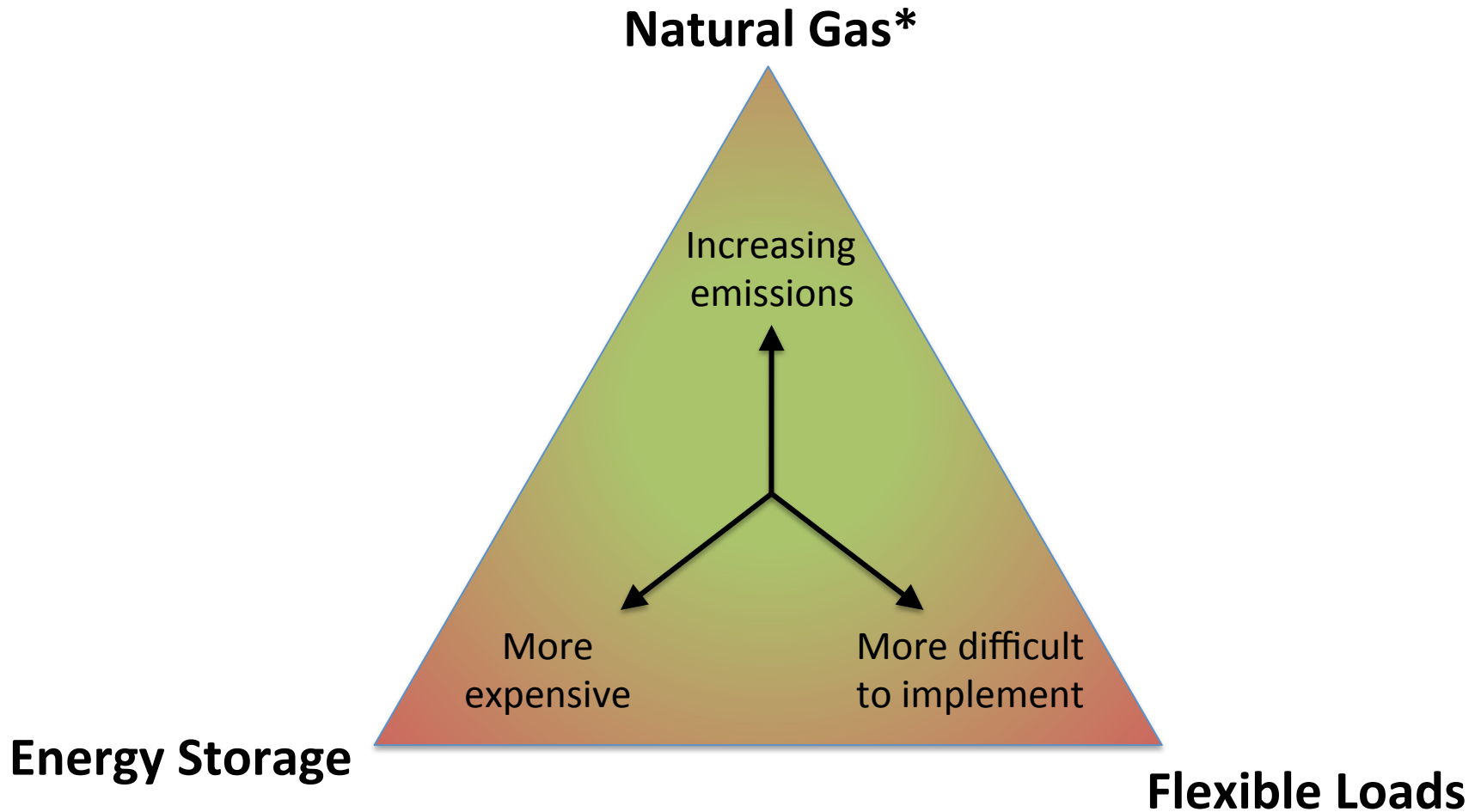
**BASELOAD**

**INTERMITTENT**

# To baseload or not to baseload

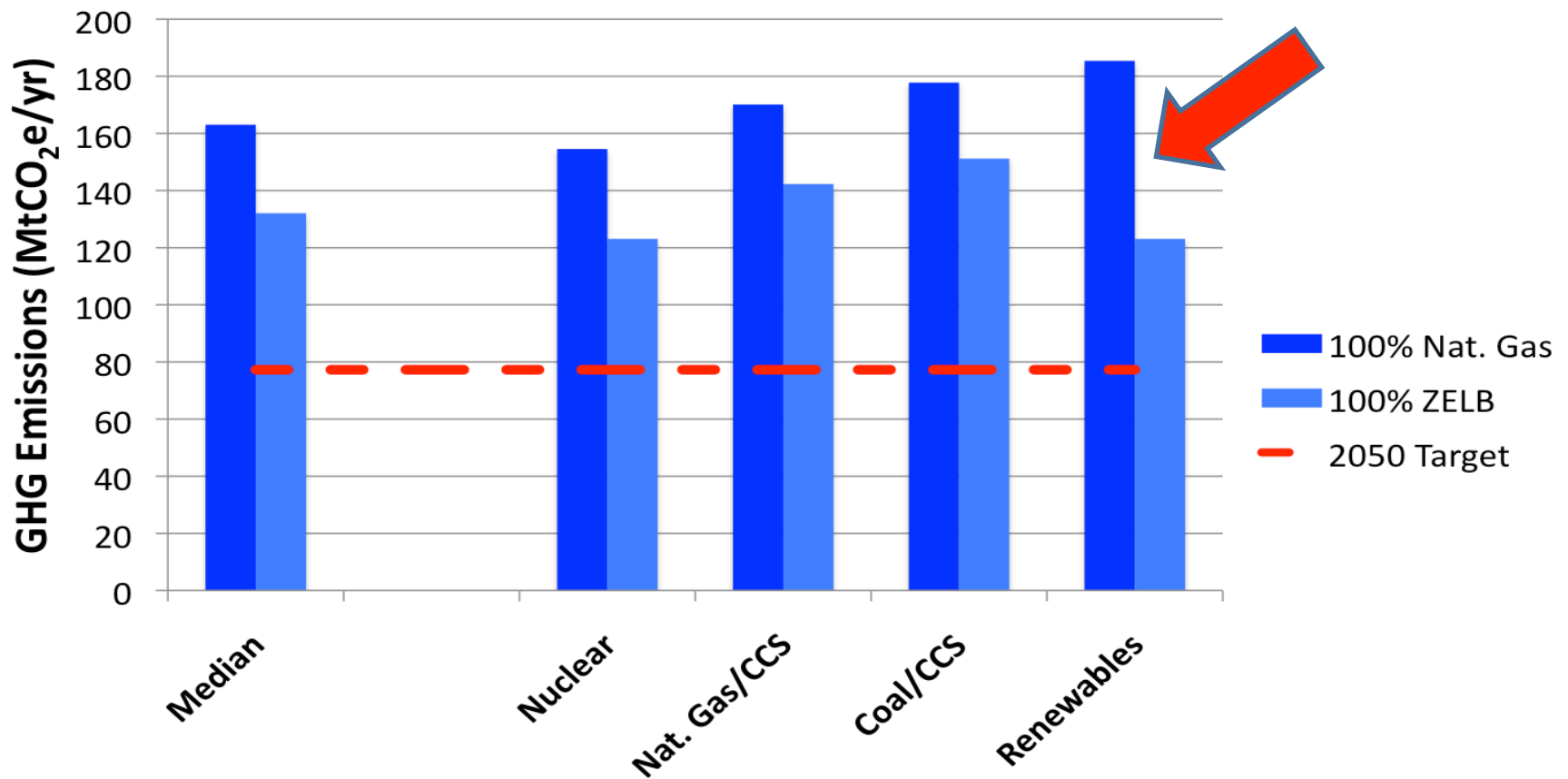
- Nuclear power has the smallest capacity requirement
- For intermittent resources will need about 3 X the capacity

# Load balancing can add emissions:



*\* May be possible with CCS in future*

# Renewables: more load balancing and more difficult load balancing



# Need to evaluate the risk of nuclear power to the risk of not having nuclear power

- Do we want to accept the emissions associated with load balancing with natural gas?
- Can we do CCS /fossil for baseload? Are we committed to storing CO2 underground?
- Do we want to completely restructure the electric utility much like the revolution in the phone business? (Could we have really smart meters?)
- Will there be a major breakthrough in energy storage technology to handle GW-days of demand?
- Should we decide to give up on electricity reliability?

If the answer to these questions is “no” or “not sure”  
then its really hard to avoid nuclear power.



# But Fukushima Happened

- Brings the risks of nuclear power into exquisite focus.
- How do we respond to nuclear accidents? How do we learn? What do we learn? Does it help? Burton Richter
- What are the issues with the regulatory regime we have now? How do we assess risks? Edward Blandford