

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

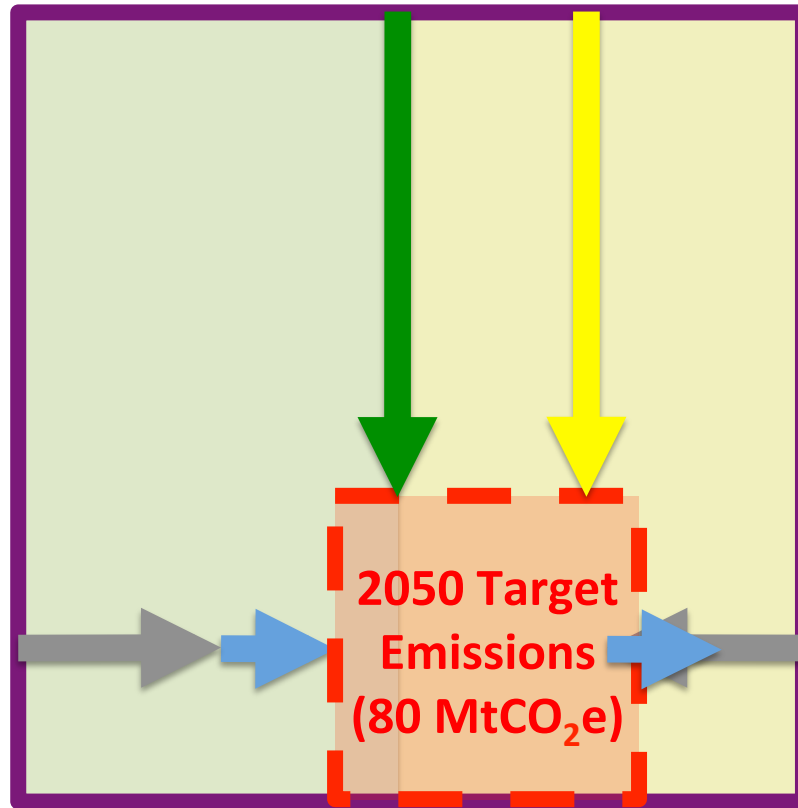


GHG
Intensity

Electrification



Efficiency



2050 Target
Emissions
(80 MtCO₂e)

Fuels

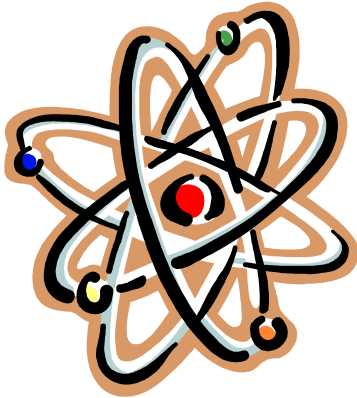
Electricity

Demand

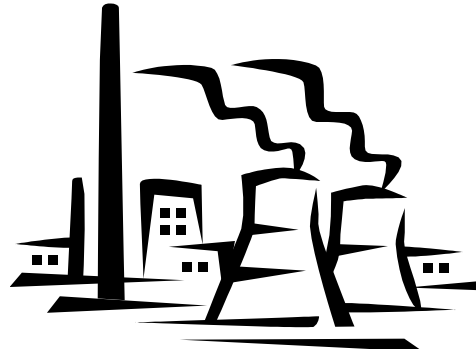
**We will be more or less doubling electricity
at the same time we decarbonize this sector**

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

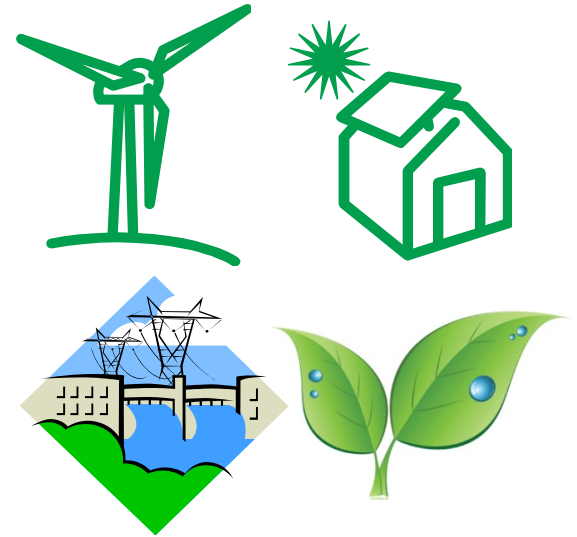
There are 3 Low-Carbon Electricity Options



Nuclear



Fossil/CCS



Renewables

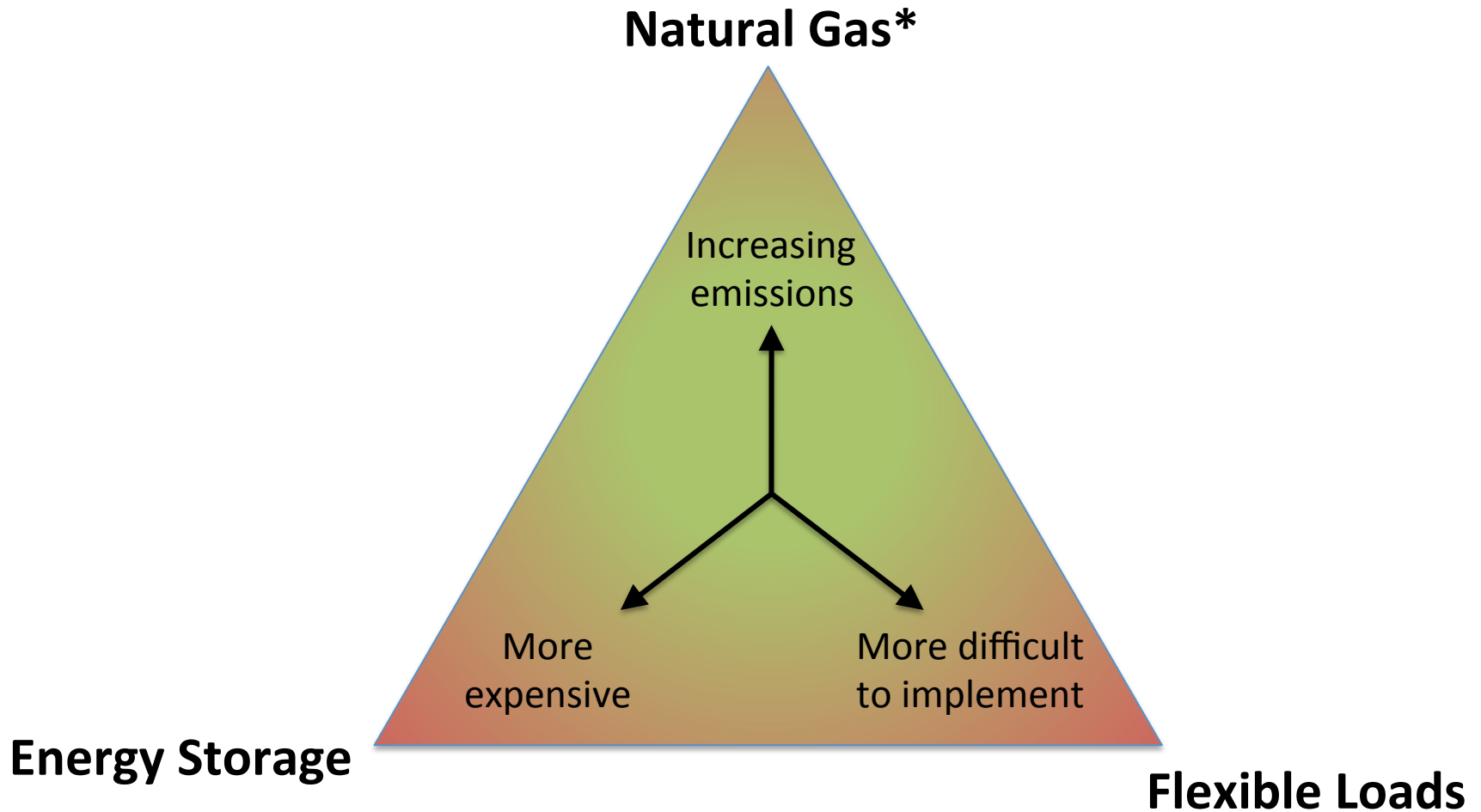
BASELOAD

INTERMITTENT

To baseload or not to baseload

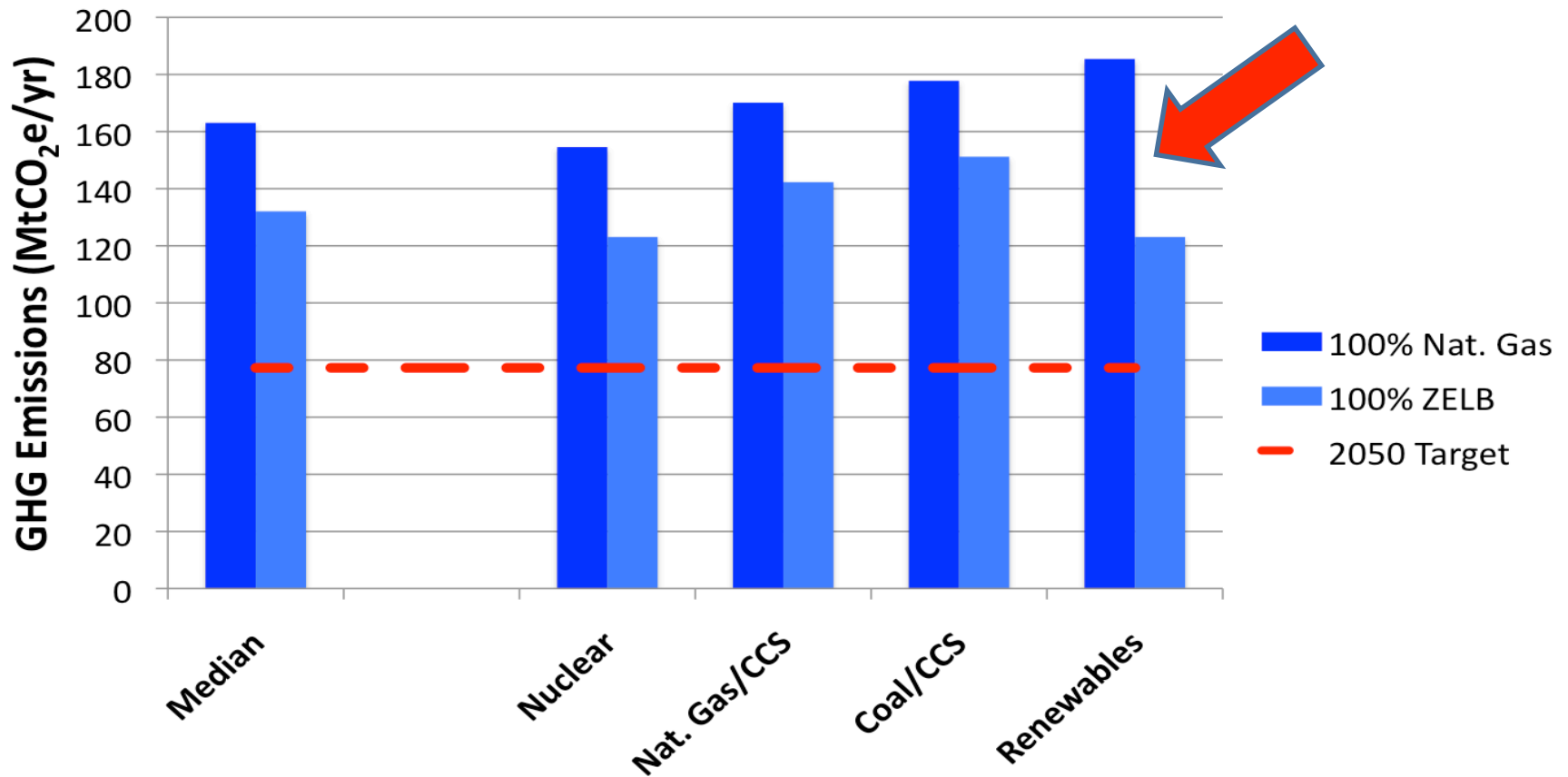
- Nuclear power has the smallest capacity requirement
- For intermittent resources will need about 3 X the capacity

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