



Consideration of Alternative Energy Sources in the Licensing of New Nuclear Reactors

February 17, 2015

Andrew J. Kugler

Sr. Environmental Project Manager
NRC Office of New Reactors

Agenda

- NRC and the National Environmental Policy Act (NEPA)
- Purpose and need
- Types of energy alternatives
- Evaluating energy alternatives
- What does “obviously superior” mean
- Will small modular reactors be different

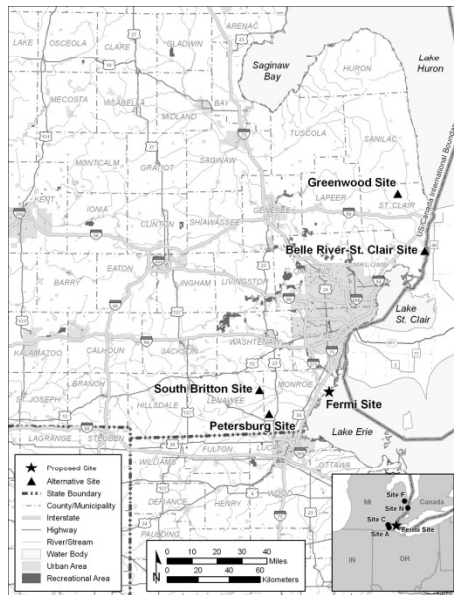
NRC and NEPA



- Federal agencies must consider environmental values in their actions
- Environmental impact statement (EIS) for licensing a new reactor
- Must consider alternatives to the proposed action

NRC and NEPA

- For reactors the alternatives include:
 - Energy alternatives
 - Siting alternatives
 - Design alternatives



Purpose and Need

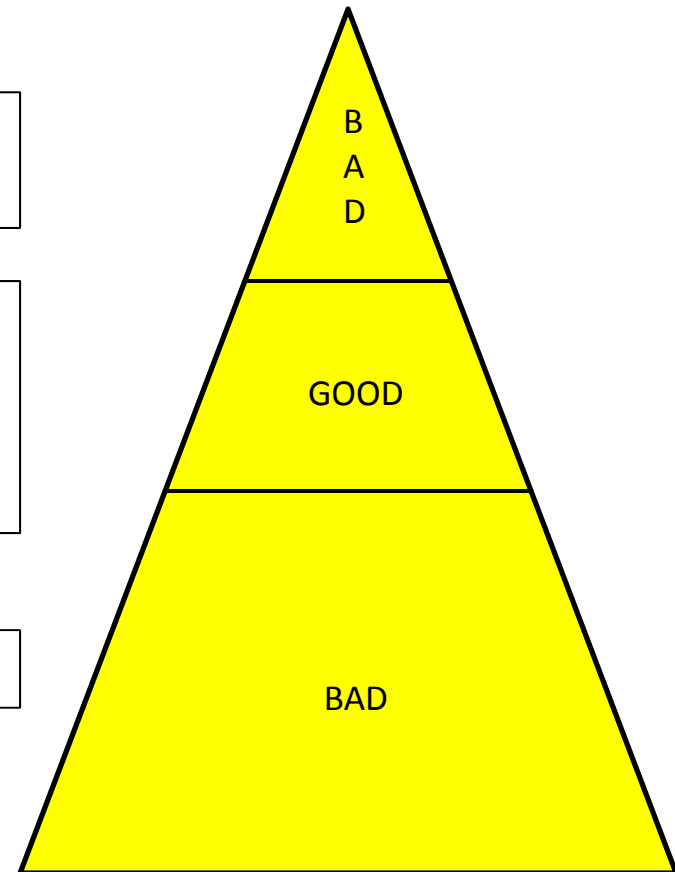
- Agency defines the purpose and need for the proposed action
 - Considers applicant's input
 - Cannot be too narrow
- Properly defined purpose and need:
 - Focuses the review
 - Drives identification of reasonable alternatives
 - Saves time and effort in the review

Purpose and Need

Build 2 BN1200 nuclear units at the XYZ site to meet future energy needs

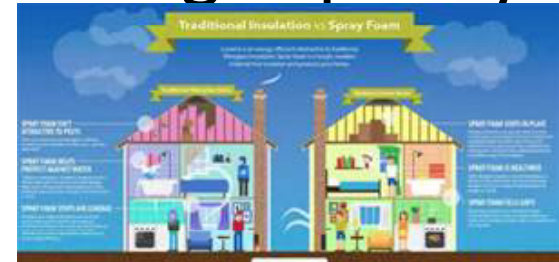
Build and operate a new power generating station to provide at least 1500 MW(e) of baseload power to the ABC Co service territory by 2025.

Build a power plant to generate electricity



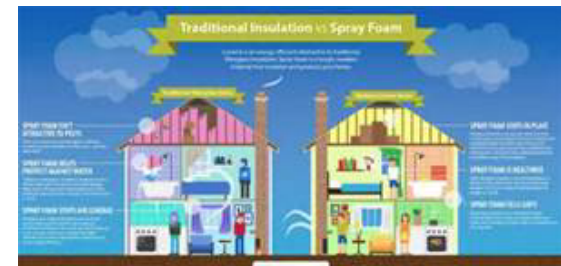
Types of Energy Alternatives

- Alternatives without new generating capacity
 - Conservation/energy efficiency
 - Imported power
 - Delayed retirements/reactivation of units
- Alternatives with new generating capacity
 - Fossil fuels (e.g., coal, natural gas)
 - Renewables (e.g., hydro, biomass, wind, solar)



Evaluating Energy Alternatives

- Applications typically to provide large baseload generation
- Conservation/EE and energy imports already considered, but still need more power
- Available renewables cannot supply baseload at levels needed in system
- Alternatives that can't meet the purpose and need are eliminated

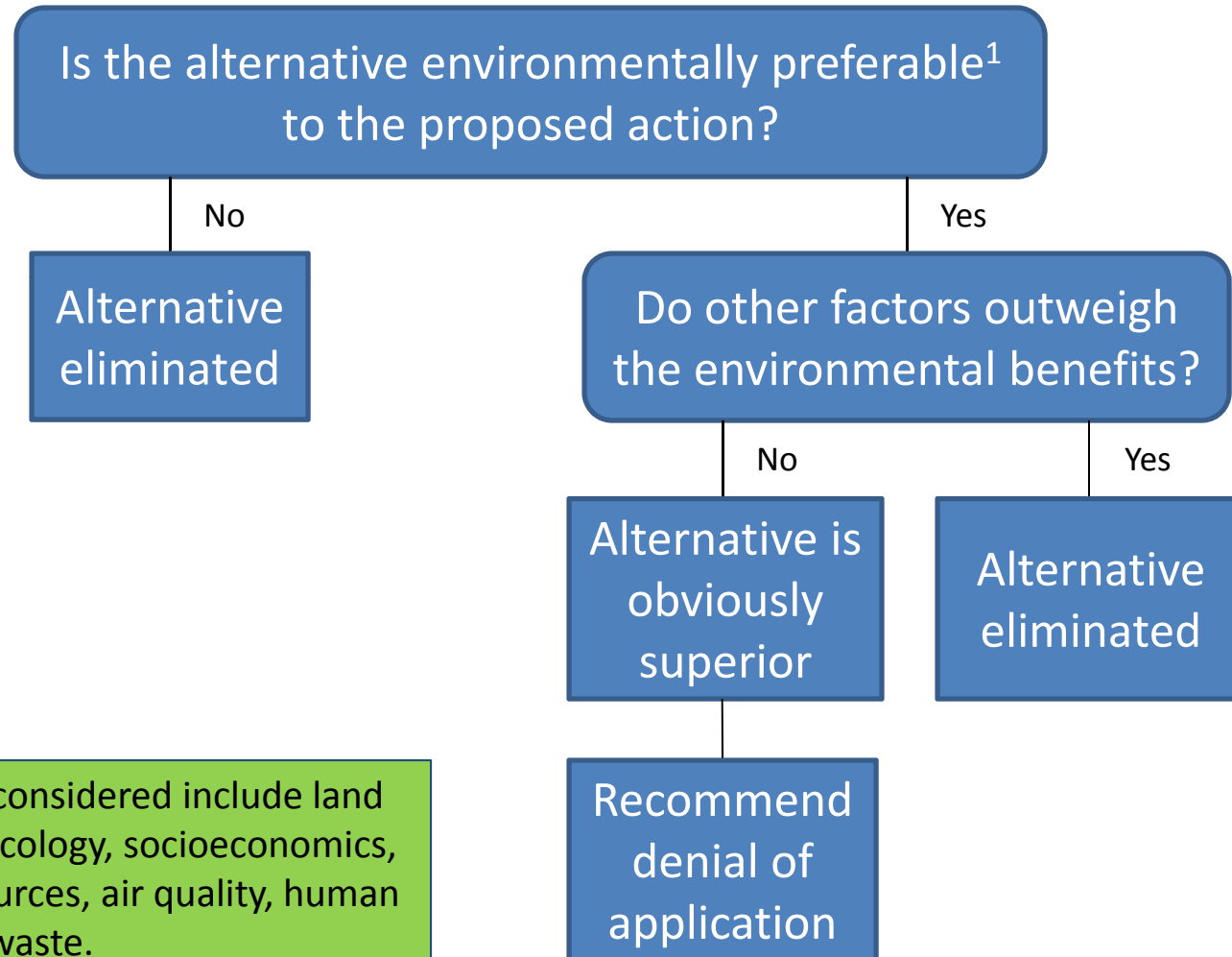


Evaluating Energy Alternatives

- Reasonable baseload alternatives typically:
 - New coal-fired generation
 - New gas-fired generation
 - Combination of gas/renewables/conservation
- Reasonable alternatives compared to proposed action – any obviously superior?



Obviously Superior Test



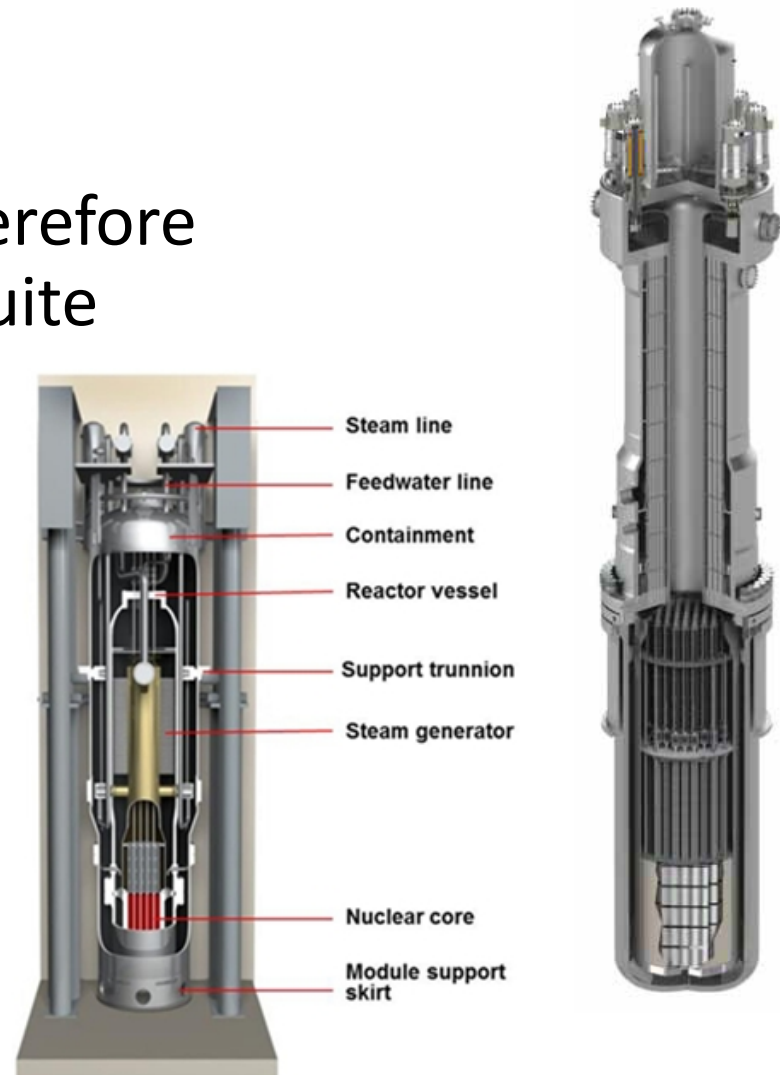
¹ Resources considered include land use, water, ecology, socioeconomics, historic resources, air quality, human health, and waste.

Obviously Superior Test

- Environmentally preferable – impacts of the alternative are measurably less than the impacts of the proposed action
- If an alternative is environmentally preferable, consider additional factors in balancing
- Other factors for obviously superior test
 - Cost
 - Institutional constraints
 - Regulatory issues
 - Fuel diversity

Small Modular Reactors

- Because of smaller size:
 - Purpose and need and therefore the alternatives may be quite different
 - More alternatives may be competitive
 - Conservation
 - Renewable sources
- Earliest possible plant application in 2015



References

- NRC website at www.nrc.gov
- *Environmental Standard Review Plan*, (ESRP, NUREG-1555), <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1555/>, Section 9.2
- *Interim Staff Guidance on Environmental Issues Associated with New Reactors*, COL/ESP-ISG-026, and *Interim Staff Guidance on Specific Environmental Guidance for iPWR Reviews*, COL/ESP-ISG-027, both at <http://www.nrc.gov/reading-rm/doc-collections/isg/col-app-design-cert.html>

Questions?