



Hot Topics

Important issues for Entergy's customers, employees, investors and other stakeholders.

The Promise of New Nuclear

The Department of Energy (DOE) projects demand for electricity will increase 50% — 350,000 to 400,000 megawatts — over the next 20 years. The electric utility industry must work now to ensure that further supply is available, which will require exploration of new sources of power, including the latest nuclear technologies.

Nuclear power provides a cost-effective and plentiful supply, and can be brought online to produce large volumes of energy at low cost and with very low adverse environmental impact.

Frequently Asked Questions about the Future of Nuclear Power

What is the future role of nuclear energy if we want to get serious about the environment and climate change?

Entergy is pursuing a two-track approach to keeping the nuclear option available – helping a coalition to build an advanced light water reactor near-term and pursuing the development of a super-safe, meltdown proof, terrorist hardened, high temperature gas-cooled reactor that can split water into hydrogen and oxygen, and be a low-cost source of hydrogen for a new energy economy in the long term. Advanced light water reactors have been designed and certified as ready to build by the Nuclear Regulatory Commission. But there is too much financial risk for any single company to build one now. Investors likely would consider that building a new nuclear plant would place a company's financial condition at unusual risk (See Freedom Reactor™ below).

Both types of advanced reactors are environmentally friendly. Neither emit air pollutants. Every other large volume, expandable and dependable way to generate power does. If we decide to get serious about reducing greenhouse gases and slowing climate change, and eventually we probably are going to have to, we will have to depend on nuclear energy. Nuclear is the only way

that we know to generate large volumes of low-cost electric power dependably every day without polluting the air.

Why don't we rely on renewables, such as wind power and solar cells?

We need as much renewable energy as we can get. But it doesn't appear we can get nearly what we will need.

After more than 20 years of researching and promoting, today wind, solar, geothermal, wood, tires and garbage burning total only about two percent of total U.S. generation and some of that emits significant air pollutants (burning tires, garbage).

A large part of the problem with wind and solar is we cannot depend on them. The wind doesn't blow and the sun doesn't shine all the time. In fact wind and solar devices typically can generate power only about 25 percent of the time.

Nuclear power is dependable and clean. Power is there when you need it.

How do advanced reactors work and why do they make so much sense?

We are calling our version of an advanced reactor "The Freedom Reactor™" It is the high temperature, gas cooled reactor mentioned earlier. It has the potential to reduce our nation's reliance on foreign oil and natural gas.

It can be built in small modules. About 265 MW units vs. today's 1,000 MW units. So it has the potential to be less financial risk. It is also built underground, where it can be very secure.

It is very safe because it shuts itself down if it overheats and cools itself by simply the natural flow of air if needed.

It would be cooled by helium gas, an inert element in nature. Helium does not become radioactive, so if it ever leaked out, it would not pose any threat. It therefore needs no emergency plan beyond the fence of the plant. No public evacuation plans would be necessary.

It produces much less nuclear waste than either today's light water reactors or tomorrow's advanced light water reactors. There is some waste to transport.

It also operates at 700-900 degrees C, more than twice as hot as today's light water reactors (250-350 degrees C). At that high temperature, water can be split into hydrogen and oxygen in a closed, recirculating loop process that produces no waste. It could be a new high-volume, low-cost source of hydrogen to fuel a hydrogen economy.

Why is hydrogen so attractive? Can it be used to power fuel cells in cars and trucks?

Nuclear energy and hydrogen can produce the cleanest energy we know. Hydrogen can replace oil or natural gas as the energy we use in cars and trucks. Nuclear power can produce electricity or hydrogen without harming our air. And, it would be domestically produced, increasing our energy diversity and independence from foreign oil and gas.

Today the federal government is providing millions of dollars for research to the U.S. auto industry to develop fuel cells for cars and trucks using hydrogen as their fuel source. Fuel cells have provided the electricity to run our space ships for decades.

Yet today we have no large source of hydrogen that does not also pollute the air when it is made.

Hydrogen today is made by steam reforming (breaking down) natural gas. But for each ton of hydrogen produced, seven tons of carbon dioxide, the chief greenhouse gas, is released to the air.

Is nuclear waste a long-term problem?

No, not really. Used nuclear fuel is very manageable. You could stack all the used nuclear fuel produced by all 103 commercial power reactors from their first day of operation on one football field and it would be about five yards high. Compared to the huge volumes of ash and/or pollutant gases produced by burning other fuels, the amount of nuclear waste is relatively small.

Yucca Mountain in Nevada has been selected to be the federal depository of all nuclear waste.

Used fuel is being stored today in large steel-lined, concrete casks at nuclear power plants safely. Similar casks can also be used to transport used fuel safely.

But used fuel is not all waste. Only about 2-20 percent of the fissionable fuel is burned in today's once-through nuclear fuel cycle. So 80-98 percent of used nuclear fuel is still good and can be reclaimed. But President Jimmy Carter decided in the seventies that the U.S. would not reprocess used nuclear reactor fuel because of a possibility that some nuclear material could be stolen and used to make a nuclear bomb.

Other countries are reprocessing used nuclear fuel and therefore have greatly reduced used nuclear fuel issues. England, France and Japan have reprocessed their used nuclear fuel for years. France reprocesses used fuel for all the countries of western Europe.

Yucca Mountain is being designed so that the used fuel can be retrieved at some future date if world energy supplies become so short or high priced that future generations want to reclaim unburned uranium in today's used nuclear fuel.

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