



WEDGEMERE

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## **The Other Clean Ones**

Many words in our industry are used today as if we all know what they mean, i.e. as if they all had an official definition written down somewhere. But that kind of definition is rare. Definitions are instead usually reserved for special purposes, for example putting a definition of energy efficiency into a legislative proposal for tax incentives to determine which measures are eligible and which are not.

That all makes sense, because determining "official" definitions can be really hard. I know because I have facilitated many efforts where it was

necessary to craft one. So we all operate in a world where we hope that we all know what we are talking about when we use a word. And we hope that not a lot of games are played with those words to gain political advantage or to discredit a competitor.

So.....with that intro....let me spill some thoughts on two "clean" energy resources.

When I was starting my career, I was convinced that nuclear power made no sense. Some of the nuclear construction debacles were already on the books, but it was a much simpler aspect of nuclear that struck me: It seemed like a crazy way to boil water. I saw it as not "too cheap to meter" as the early promoters had billed it, and as risky in terms of accidents. It also left dangerous waste that needed to be safeguarded for a long, long time.

Not only did I find it hard to support nuclear from a technology standpoint, but this was also the time that a couple of

books about the "Soft Path" and "Appropriate Technology" became best sellers. It was the time that a movement was beginning, and I found myself participating in anti-nuclear rallies.

I was not anti-nuke for long. Instead of being against something, I instead turned to being an advocate of energy efficiency and renewable energy. Then, as I began to understand carbon emissions and global warming, I started to look at nuclear in a different light - the context of carbon. I got involved in supporting a major presidential contender in the 1992 presidential campaign and worked with him to help him voice support for nuclear because of its zero emissions.

Today, unlike in those days when hardly anyone was paying attention to carbon emissions, more and more people are thinking about climate change with each passing month. Polling, policy developments and advocacy activity all demonstrate this. Yet nuclear now faces

another challenge. Just as natural gas has put coal in its grave, it has affected other contenders on both the supply and demand sides. It has put new economic pressure on nuclear plants and resulted in moves to shut them down.

These moves come at the same time that states across the country have adopted aggressive clean energy goals. Those states with nuclear resources therefore have faced a dilemma - is it smart to shut down a major zero emissions resources when you may find yourself struggling to meet the ambitious emissions reduction goal you have set? To address this conundrum, several states have moved to create subsidies for nuclear facilities in order to keep them in the game. I understand that there is a lot more going on in the nuclear subsidy battles than zero emissions. But the efforts to keep the nukes on line display one important aspect that I don't believe they are given credit for - carbon free.

There is another carbon free resource that has not been, and is not today, without controversy.

Just as I thought that nuclear power was a crazy way to boil water for a steam turbine, I always thought that hydropower was an intuitively great way to use water to produce electricity. But then when I found myself running a DC office for a utility that had hydro resources, I learned that hydro was not as simple as it seemed. I found myself involved in policy efforts where hydro was being excluded from being defined as renewable energy. I quickly learned about the opposition to hydro and why some of it had a reasonable basis. There were fish and wildlife issues, and land use and preservation issues. There were cultural issues related to keeping rivers undammed and free flowing.

Over the past couple of decades, I have observed two very different things happening with hydro. First, a lot of small

hydro has been developed, especially at existing dams where it was no longer being utilized. Second, dams on some rivers have been blown up and the rivers they were on have been restored to their former state.

But yet - and I admit that maybe I am just not reading the right things - I feel like hydropower is not getting enough attention. That may be because according to most official estimates, the locations for hydro facilities are limited, especially when all of those controversial factors I mentioned above are considered. But now and then I see some story about small - really small - hydro, as in turbines that are so small that they can harness the energy in the water flows that are all around us in pipes and systems, or in a very slow moving, low-head trickle of a stream behind our house. I hope more of this is happening than I am aware of. It makes sense to not continually assess this carbon-free resource as we move to an electricity future of disaggregated,

distributed resources and dynamic efficiency - all of it optimized by technology and information.

So ...I want to raise a supporting hand for nuclear and hydro, because my no-emissions screen keeps getting tighter and tighter as the climate data keeps rolling in. I admit that nuclear may be a hard one to swallow for many of you, but make sure you are differentiating between existing plants being shut down and new plants being built. Both of them may be appropriate moves from an emissions standpoint, but at least let's be careful before we eliminate an existing resource that produces no carbon. And remember that natural gas is not carbon-free.

I know that I have not mentioned the nuclear waste issue yet in this essay. So here is my take on that. It is a serious issue that has been inappropriately hampered by the politics of the U.S. Senate. It is not the kind of legacy that I like to think about leaving for future

generations. But I think it is the kind of confined and concentrated problem that science and technology can deal with a lot easier and more effectively than they can carbon emissions. The latter are so disaggregated with so many emissions points that the challenge of reducing and controlling them is a very significant for the world.

While I have concerns when I hear someone promoting an "all of the above" energy policy because I fear can be used for the wrong reasons, I am all of the above when it comes to clean energy when that term is defined as zero carbon emissions.

I don't want to leave a legacy of nuclear waste to my descendants. But more than that, I don't want to leave a legacy of serious, long-lasting climate change and all of the baggage that come with that.

Dan