

WHY APPROPRIATE TECHNOLOGY IN REGARD TO WATER IS SO IMPORTANT

The unique history and inherent instability of water development in the western US was described in great detail in the seminal work of Marc Reisner published in 1986. (Cadillac Desert, By Marc Reisner 1966 Viking Penguin) This book won a Pulitzer prize the following year. It goes into great detail how the settlement patterns in the Western states were made possible by massive public works projects by Federal, State and City governments. It also sounded a warning of how delicately balanced and thus potentially unstable these elaborate man made systems are and how difficult it will be to maintain them in light of our regions history of long range climatic fluctuations.

Today 20 years after Reisners warnings his study is beginning to be validated. However his validation of historical patters is now intensified by new threats of our own making. The dominate one is of course rapid climate change brought on by our proliferate burning of fossil fuels but there is also a host of other factors as well such as increased cost of the massive amount of energy used by our present system as the peak in major fossil fuels is reached which makes maintenance of present system and development of new systems increasing difficult. Climate change means generalized warming which is already reducing the mountainous snow pack upon which much of our present water infrastructure depends. It will effect coastal areas by increasing salt water intrusion due to rising sea levels. It also increase the chaotic patterns of storms, droughts, wildfires etc. Mitigation measures will have to be massive to prevent even further climatic disruptions. All these factors will put massive pressure on the way we are doing things including the way we obtain, use, and treat water.

Water concerns are rapidly becoming as important as energy concerns. Like energy concerns this will force us to look at the whole water picture in more depth than we have over the last hundred years. Like energy concerns we will have to look at the supply aspects of water and the demand side of waster as well as the scale of these concerns. Effective response to a series of energy crises over the last 30 years have been held back by the difficulty we as a society had in differentiating between supply side characteristics and requirements and demand side characteristics and requirements and how these can be combined in various ways depending upon the scale and degree of integration.

A quick analysis our society's approach to the series of energy crises we faced in 1972, 1976, 1986 and 2000 will be instructive in clarifying the patterns behind our slow and less effective responses because these patterns are the same with water. More creative response will help us have a more timely and effective response and illustrate the important role appropriate technology can play in this response.

Because we live in a industrial oriented culture we have several accepted ways of thinking about things that have to be modified in creatively coming to grips with these problems. The first is our unspoken bias that applying more of the methods that have worked so well over the last 100 years is the best approach. Our bias toward highly differentiated systems means we put far too much emphasis on one aspect of things rather than looking at the whole. For example at the first energy crisis production side dominated almost all discussion. The automatic conclusion was we just needed to produce more energy. Billions of dollars were spent on trying to do this with mixed results. Much less effort was spent on the supply side of things because it was less technological and more cultural, dealing with soft squishy stuff like perceptions, behavior patterns, conservation etc. The irony was the gains made on the supply side of things was more than offset by energy overuse and downright wastage that occurred on the demand side. Thus with the

peaking of fossil fuels coming down on us we find ourselves in a even bigger crisis even after 30 years of intense effort. There is also a third aspect to the energy question than has been even more ignored but that we are now finding could produce great results. This is the integrated or hybrid approach to the energy question. In this approach combine production and use at a easier to integrate smaller scale. This is what we do in green buildings. We use on-site energy (sun, wind, night air etc.) to heat, cool, daylight, ventilate, and produce electricity and we find that the potential savings are tremendous (In the order of half the energy used in the U.S.) at less cost to us. The reason this third approach has been so neglected is that it is in many ways the opposite of the industrial mindset. Efficiency produced by integration rather than differentiation, by using efficiency of miniaturization rather then efficiency of large scale, by combining technology and behavior in a synergetic whole. The 1980s name of this approach was passive solar architecture, the 2008 description is high performance green buildings.

In regard to our water situation appropriate technology is the equivalent third approach in contrast to the supply side approach of just more water production and the demand side approach of conservation. As were painfully discovered in our energy traumas this third approach has the potential for great benefits at less cost and effort than the other two operating in isolation. Relatively easy supply side approaches to the water situation have already been done. What's left is very expensive and environmentally disruptive like importation over long distances, desalination, very deep pumping, etc. Furthermore as discussed above there are threats to the present systems due to climate changes and other factors. There is more that can be done on the demand side but changing human behavior patterns in the abstract are difficult and tedious.

The integrated hybrid approach which is really what Appropriate technology is all about could yield greater results than the other two at this point in time. We have carefully spelled out the full spectrum of techniques to this hybrid approach which has become the structure to this study.