

F I V E T W E L V E G R O U P

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## THE FINITE WATER ECONOMY





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### What is a Finite Economy?

A colleague asked the other day: what is the difference between businesses that play by "infinite" rules and those that play by "finite-rules?". The answer required only one word: sustainability.

Essentially, "Infinite-rules" underly what Greenspan coined "irrational exuberance"; the belief that growth in something is either perpetual, or at least, easily discerned by those in the know. Businesses playing by "infinite-rules" assume that a market won't be held back by limits in key ingredients like talent, credit, liquidity or energy and instead of guarding against the backlash of those limits, tend to build more businesses based on them, essentially doubling and tripling down on them. You need only think of our recent subprime mortgage crisis, and the impact of the bursting housing bubble.

"Finite-rule" driven businesses, on the other hand, understand that there is as much to be gained through understanding the limits of a market as there is to understanding a market's potential and that knowing that the growth side of the curve is as much influenced by fundamental finite truths as the contraction side of the curve. They take lessons from LEAN thinking, in which identifying bottlenecks, as well as growth drivers, are the focus of process improvement. But it isn't just about "doing more with less." It is as much about not doing things that are not necessary to do and never creating and spilling off waste in the first place. Let's take a look at the business of clean water to get further insights into this concept.



## Water Fundamentals

Investors often mistake the clean water business to be one of almost unlimited pent demand. In my town, business and government leaders often meet to publicly celebrate the water market's "never ending" potential, and talk of trying to capture as much of it as possible with technologies and business services. While their efforts to recruit business and talent to the area and recent performance of water technology businesses in the whole are to be applauded, let's suggest a healthier and more realistic perspective than just assuming it to be a large and growing market, ad infinitum.

The basic argument that there is money to be made in water goes like this:

1. There are more people
2. There are fewer sources
3. There is more risk and will be more regulations

... and therefore, we will always spend more to get clean water.

Finite-rules force us to admit that there are no new water sources. Water is finite on this globe, and it is distributed across its surface inconsistently, and often, without consideration of where people will live, and how they plan to use it.

Most work associated with water is in moving it around to meet demand, or to clean it more aggressively. Both processes use energy and machines and create waste byproducts in the process. The infinite-rule business approach to the market is to build more larger machines and assume that nothing will change except that we'll never run out of dirty water to treat. It assumes that as more people concentrate more densely in areas with dirtier water, we'll re-use more of the water in these areas, we'll need more larger machines that consume more energy, that the market will have to be prepared to pay more per gallon of clean water, and that this will go on endlessly.



## Clean Water Realities

Finite-rules reveal the realities of the clean water market:

- First, finite-rules uncover the truth that all water is re-used; the only question is on what scale. Is it a tiny closed-loop like on the space station, or a large one, like on a continent? The more pressure from population and urbanization, the more we feel the limits of the resource. Given this, finite-rules show that the price for water isn't the price for water, but for preparing it; the energy expended to either get it somewhere, or to make it ready to be safely used, sometimes over and over.
- Second, water isn't actually treated. All water cleaning is a process of separation and isolation: energy spent to concentrate the bad stuff (often suspended in water) and the clean water is left to be re-dirtied.

And here's the rub: cheap energy sources to fuel the work and places to put waste are finite too.

## Finite-Rule Thinking in Water

So clean water leaders are rethinking the process: the goal isn't how to treat or transport ever more water or how to do it over and over more frequently, but how to place suitably clean water exactly where it is needed and to do it using the smartest energy source while creating the least waste.

It's the water version of the smart grid: adjusting to the special challenges of local supply and demand instantly. The more precisely the system can adapt to either source conditions or consumption needs, the more efficient it will be. The result of realizing such a vision is a dramatic reduction in infrastructure scale to do the same work, less public debt and more people served with cleaner water at less cost.

Recent research from FiveTwelve Group confirms three major new trends -- responses to the finite-rule taking hold in water markets:



1. We will clean water in smaller increments; measured in gallons as opposed to millions of gallons, because it is a more efficient use of both cash and energy.
2. We will treat water to differing levels of cleanliness depending on intended use by using simpler, more adjustable smaller-scale machines that are easier to buy, install and run, and which produce only the waste required for immediate demand.
3. Since we're buying energy for cleaning and space to place waste (not water), energy and waste systems design is being married with water systems design. Architects and civil engineers are rejecting large central, fixed-used designs, in favor of small scale water cleaning systems in turnkey packages that address fuel source and waste recovery in the process.

In response to these trends, the business of clean water is quickly transforming from one organized around large scale systems with long-term public leverage to pay for vast redundancies, to one organized around quickly dispatched systems, public/private investment, cost sharing and sustainable energy sources.

As this clean water example shows, finite-rules first find the constraints in a market; the fact that some resource is always limited and pressures on it mustn't be increased, but instead, must be relieved. And finite-rules suggest technical integration and transformation that is often unseen, or even unimaginable to the business that can't account for fundamental limits. In the process of seeking and finding these things, value is created and businesses succeed.

We don't expect everyone to win. With so many companies designed to respond well to the notion of burgeoning demand, we see very few who will be able to shift and add value by enabling the shift to small scale, integrated systems. So we think it is safe to assume that the competitive landscape in water will shift in this correction, and dramatically.

It's also safe to conclude that finite-rules apply in water.

-- Nicholas Hayes, Partner, FiveTwelve Group, Ltd.



## ABOUT

This essay is part of a larger series reflecting major market swings and their consequences, as understood by the research and consulting firm FiveTwelve Group. We focus on global, regional and local issues, and new opportunities in the 21st century. This series is call The Finite Rules. Read them all at <http://www.fivetwelvegroup.com/blogs>.