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Before the:
Subcommittee on Water and Power
Committee on Natural Resources
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515

Legislative Hearing on the *Reauthorization of Water Desalination Act of 1996*

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1324 Longworth House Office Building

The Competitive Enterprise Institute (CEI) is a non-profit public policy research organization dedicated to advancing individual liberty and free enterprise with an emphasis on regulatory policy. We appreciate the opportunity to discuss issues surrounding innovation and research in water access as an element of broader science and manufacturing policy.

CEI maintains that competitive approaches to expanding infrastructure industries and the technologies and innovations underlying them will be more effective than political interventions at boosting innovation, enhancing consumer well-being, facilitating commerce and trade, and advancing national prosperity.

Separation of State and Water: The Case of Water Desalination

Water availability is a core infrastructure concern. One approach to expanding supply, desalination, is the removal of salt (sodium chloride) from seawater or brackish water to

render it fit for human consumption or other uses. H.R. 745 would reauthorize the Water Desalination Act of 1996, The specific legislative issue is what role the federal government should play in future water desalination.

The original Desalination Act, signed into law by President Bill Clinton, authorized “Research and Studies” and “Desalination Demonstration and Development.”¹ H.R. 745 would furnish \$3 million annually through 2018.

The drive for an urgent federal role persists. In a media statement announcing the reauthorization legislation, bill sponsor Grace Napolitano (D-CA) said:²

Desalination is critical for the future of a reliable, sustainable water supply, especially for our western states.... We must continue to provide federal funding to enhance technologies for producing new water from the ocean in order to combat drought, population growth, and climate change. Increasing our desalination efforts will drive down costs and be a powerful engine for economic growth, and I urge my colleagues to support these critical programs.

That’s one worldview. CEI, however, holds that policymakers’ objective should be to increasingly subject water strategy decisions and investment to marketplace pressures, and if those pressures have been subverted by past political choices, to return them to the private realm. Like spectrum, airsheds and environmental amenities generally, water is one of the key resources that never truly entered the wealth creating sector since the progressive era interrupted extensions of private property rights.³

While a separation of state and water is appropriate, we bear no malice toward desalination as a concept. We want it to succeed widely and profitably as we’re glad hydraulic fracking now succeeds, and as we hope to see methane hydrates and other frontier technologies work.

Introduction: A Fountain of Solutions

Water access is globally contentious. A recent *Wall Street Journal* book review on the “unhappy descent” of Turkey’s Meander River couldn’t help but invoke common laments that, “In North America, so much water is taken out of the Colorado that it no longer

¹ Water Desalination Act of 1996, Public Law 104-298, <http://www.gpo.gov/fdsys/pkg/PLAW-104publ298/pdf/PLAW-104publ298.pdf>

²Rep. Napolitano Reintroduces Desalination Bill, Press Release, February 15, 2013. <http://napolitano.house.gov/press-release/press-release-rep-napolitano-reintroduces-desalination-bill>

³ See Fred L. Smith Jr., *Eco-Socialism: Threat to Liberty Around the World*, paper presented at the Mont Pelerin Society Regional Meeting, Chattanooga, Tennessee, September 20, 2003. <http://cei.org/pdf/3818.pdf>

reaches the sea. Nor does the Rio Grande. Or the River Jordan. Or China's Yellow River."⁴

Access to water is a fundamental national infrastructure concern; further, the issues surrounding innovation and research in water policy are elements of broader science and manufacturing policy.

At the local level, aggravations abound. Penalties also abound. An Oregon man catching rainwater on his own property received 30 days in jail. He was apparently breaking a 1925 law against personal reservoirs,⁵ but when scarcity and emotions run high, what was once minor and ignored by all can become diversion and theft.

In addition to quirky developments like rainwater theft prosecution, water policy can be fundamentally perverse and distortionary: systems may not cover their debts, operations and capital replacement needs, and as governmental monopolies sometimes "are used as cash cows to support more labor-intensive functions of local government, such as fire and police."⁶ Problems can plague national government-driven approaches.

The emphasis is always on what local state and federal governments should do to alleviate scarcity, thus efforts like desalination. But governments are and were already in control before the Desalination Act, and have always been for the most part; so a rethinking of that basic reality might be in order. Impulses that tend toward national programs and grand governmental programs that waste both water and money should be resisted.

Policymakers should subject water policy decisions, pricing and investment to marketplace pressures, unpopular or even alien as that may be. For various reasons, competitive approaches to infrastructure and the technologies underlying it like desalination represent a "fountain" of solutions be more effective than political interventions at boosting innovation, enhancing consumer well-being, facilitating commerce and trade, and contributing to United States prosperity.

How can we be so confident? Charles Fishman, author of *The Big Thirst: The Secret Life and Turbulent Future of Water*, penned a rundown of myths about water, noting even our

⁴Alice Albinia, "A Famous River's Unhappy Descent," *Wall Street Journal*, July 23, 2012. p. A11 (A review of *Meander*, by Jeremy Seal).

⁵[Kendra Alleyne, "Man Sentenced to 30 Days for Catching Rain Water on Own Property Enters Jail, CNS News, August 8, 2012. <http://cnsnews.com/news/article/man-sentenced-30-days-catching-rain-water-own-property-enters-jail>](http://cnsnews.com/news/article/man-sentenced-30-days-catching-rain-water-own-property-enters-jail)

⁶G. Tracy Meehan III, "Flood Zones: A Market Solution to the Challenge of Water Supply," (A book review of *The End of Abundance* by David Zetland), *Weekly Standard*, July 16, 2012. pp. 36-37.

ignorance of where it goes upon disappearing down the drain.⁷ In terms of quantity, water is actually not getting more scarce; it's constant on earth. And the salty oceans? They're actually:

Olympian springs of fresh water — every day, the sun, the sea and evaporation combine to make 45,000 gallons of rainwater for each man, woman and child on Earth.... Even in the United States, where we use water with profligacy, the oceans are making more fresh water for each of us in a month than we'll use in a decade.

Fishman continues, “We never really use it up. Water reemerges from everything we do with it, whether it's making coffee or making steel, ready to use again.”

Water is both a necessity and a luxury good. We use more as we get wealthier, which requires more energy, which itself requires still more water. Nonetheless, overall the nation uses less water than in the 1980s (agriculture and power remain the largest users); families use a little more than back then.⁸

But it doesn't always rain in the same places, and over time populations shift (sometimes even in response to artificially prolific water supplies).

On top of past mismanagement of water, other challenges loom. “America's population is expected to grow by 100 million—a 30-percent increase—by the middle of the 21st century,” notes Bonner Cohen in “Fixing America's Crumbling Underground Water Infrastructure.”⁹ And infrastructure won't be cheap, apart from desalination's meager share. Cohen continues, “Over the next 20 years, upgrading municipal water and wastewater systems is expected to cost between \$3 [trillion] and \$5 trillion. Building and replacing water and sewage lines alone will cost some \$660 billion to \$1.1 trillion over the same time period.”

There's no need for Malthusian despair, because in the face of it all, gallons of water cost Americans less than a penny. But nor is there any excuse for the perpetual tendency to see water as free, which amplifies calls for costly interventions like desalination. It's not always obvious that even the private sector should be doing desalination. They may be

⁷Charles Fishman, “Five Myths About Water,” *Washington Post*, April 6, 2012.

http://www.washingtonpost.com/opinions/five-myths-about-water/2012/04/06/gIQAS6EB0S_story.html

⁸EPA on average family use <http://www.epa.gov/WaterSense/pubs/indoor.html>

⁹Bonner R. Cohen, “Fixing America's Crumbling Underground Water Infrastructure,” Competitive Enterprise Institute, *Issue Analysis 2012 No. 3*, April 11, 2012.

<http://cei.org/sites/default/files/Bonner%20Cohen%20-%20Fixing%20America%27s%20Water%20Infrastructure.pdf>

reacting to such broader mismanagement and non-market pricing.¹⁰ As G. Tracy Mehan, writing in *The Environmental Forum*, put it, “Scottish lawns and recreational swimming are luxury items in arid areas and should bear the cost of scarcity in the price of water. Moreover, low water rates are basically middle- and upper-class subsidies.”¹¹

Desalination: The Policy Context

As policy discussions about desalinization unfold, several challenges confront policymakers.¹² These challenges involve such matters as federal spending, the role and limitations of federal research, adverse consequences of federal “pick-the-winner” technology investments, and failures to prioritize market pricing to address water supply constraints.

Unneeded Spending

America’s economy is faced not with just scarcity of water, but a scarcity of funds. Granted, the scale of desalination projects since the 1996 Act, a few million dollars annually, is not a lot of money compared to America’s \$3.8 trillion in federal outlays. While the dollars involved in reauthorization won’t matter much in the modern spending context, they matter in other ways for how we conduct water policy.

The expectation of funds, and the impression created in the original legislation and the H.R. 745 reauthorization can set up unneeded conflicts and competition for paltry federal dollars when better options exist. But even more importantly, federal spending’s effects *on the nature of water research and conservation itself* reverberate beyond the dollars. The dollars foster a “leveraging” of the negative rather than the positive kind in that parties should not look to the federal government and the Secretary of the Interior for guidance. In the United States, private investors, localities, states and regions are the proper locus of investment rather than the federal government, particularly if policymakers persist in enabling desalination’s detachment from marketplace pressures.

Redundant Research

¹⁰David Zetland has noted an interesting co-existence of cheap water and bad finances more generally <http://www.aguanomics.com/2012/02/link-between-cheap-water-and-bad.html>

¹¹ G. Tracy Mehan III., “The Future of Water: Technology, Economics, Political Will,” *The Environmental Forum*, May/June 2012, p. 6-7.

¹² During debate over H.R. 2664, there was one additional challenge, that of misdirected education resources and efforts. Also redundant with readily available resources and ongoing operations would be “outreach program[s] to educate the public.” H.R. 2664 also contained provisions for renewable energy use in desalination. (Library of Congress link for H.R. 2664: <http://thomas.loc.gov/cgi-bin/query/z?c112:H.R.2664.IH:>) See The new bill H.R. 745 does not contain those components. .

Federal funding for desalination projects seem financially redundant because private-sector research dollars far outstrip the proposed federal outlays. Moreover, government research has been underway since the World War II era on membrane improvement, energy reduction, treatment of desalination's waste brine, and more. Indeed, desalination is ancient technology, a method of treating water far older than the modern water capture and delivery methods it presumably would supplement. In markets, research is *itself* competitive, driven by reaction to consumer needs and to what rivals do. But in typical desalination funding legislation, competition and rivalry aren't central, making both the goal of desalination and the methods to achieve it suspect.

Policymakers ought not advocate for specific technologies, and subsidies are not merely unneeded, they can be unfair, since only certain states are involved yet all required to pay.

Federal Desalination Policy Vs. Market Pricing Solutions

In terms of market pressures, desalination is highly promising on its own appropriate terms; it's already crucial in some areas. Desalination plays vital roles globally given certain geographical and political circumstances that increase the value of desalinated water relative to other purification options. Many see it playing a growing role especially and obviously in select areas near the oceans and where transport and other costs are low or made low by complementary infrastructure investment.

On the other hand, scarcity of water itself in a free, highly mobile society like the United States—if that is what drives the desire to subsidize desalination research—is a creature of poor policy. We ought to recognize the causes of scarcity, and avoid perpetuating the “Declaration of *Dependence*” on federal dollars and decisions that affects some of America's most crucial infrastructure industries and technologies. Under the right circumstances, may well eventually become one.

If we are to judge by private sector involvement, desalination is on a trajectory to become increasingly cost-effective for certain applications, particularly if prices for water are allowed to respond to market signals as demand for fresh water increases. A federal hands off is warranted if desalination is a wise, profit-directed idea.

Conversely, however, even if the private sector did not invest “enough” in desalination, that too is reason for federal restraint. States reliant on the process may have a role, but that's their business and their prerogative to fund. Because of governmental involvement and the distortions and shifting of relative pricing it creates, it's not even clear in every case where the private sector invests that it should be doing so, particularly if subsidies or grants are the impetus for that investment.

The costs and benefits of desalination should always be apparent and never obscured. The process should never mask the otherwise necessary confrontation of underlying water scarcity, which only exacerbates problems that induce calls for desalination. Federal and local policymakers' primary task, as distinct from programs like the Desalination Act, should be the systematic dismantling of interference with water price signals so that private investors can react and build the robust critical infrastructure actually needed, the scale of which could be far beyond today's infrastructure, founded upon business models not contemplated today. Those price signals should incorporate mitigation of desalination's own potential negative environmental impacts, as property-rights based production demands. Among much else, such market pressures can do a better job compelling a "polluter" to internalize or treat waste streams than the Desalination Act's halfhearted study of "methods for the recovery of byproducts resulting from desalination to offset the costs of treatment and to reduce environmental impacts from those byproducts."¹³

Diverting energy and effort into policies that may further disguise real prices by spreading costs to non-involved taxpayers will further delay any needed general or specific reckoning with the way water is marketed and priced in the United States and with environmental issues it may create. Bearing burdens is a critical part of well-functioning markets.

Politicians frequently defend a significant, even pivotal, governmental role in complex endeavors like desalination, where they fancy themselves committing overarching good. But when it comes to the creation of technological knowledge wealth itself, that stance is worrisome. Misunderstandings persist regarding what markets even are, and of how infrastructure wealth (including water) is best created, which complicates the critique of desalination even for those inclined to question the policy.

The Modern Scope of Desalination

Mirroring the relatively small amounts proposed for desalination spending in the United States, globally and nationally the process accounts for just a fraction of water consumed.

According to the U.S. Geological Survey, "In 2002 there were about 12,500 desalination plants around the world in 120 countries. They produce some 14 million m³/day of freshwater, which is less than 1% of total world consumption."¹⁴

The feasibility of large-scale desalination is still not fully apparent, even after decades of projects. In the U.S., Florida, California, and Texas research and employ it to greater or

¹³ <http://www.gpo.gov/fdsys/pkg/PLAW-104publ298/pdf/PLAW-104publ298.pdf>

¹⁴U.S. Geological Survey, "Thirsty? How 'Bout a Cool, Refreshing Cup of Seawater?"
<http://ga.water.usgs.gov/edu/drinkseawater.html>

lesser success. Private investment aside, other nations rely more heavily on desalination technology and, logically, we can learn from their greater urgency and incentives that compel efficient implementation. Where internationally the pressures to desalinate are grave, we can acknowledge their resultant comparative advantage and resist forcing what ought not be forced.

According to the Congressional Research Service (CRS),¹⁵ some 2,000 plants larger than 300,000 gallons per day operate in the United States, but their total capacity is less than one-half percent of total U.S. water use. Two-thirds of U.S. capacity is for municipal supply. Industry uses about 18 percent of the total.¹⁶

CRS also notes that, globally, seawater desalination dominates, representing 60 percent. In the United States, that method comprises only seven percent of all desalination.¹⁷ Instead, half the total is desalination of brackish water (which had been the emphasis of an earlier reauthorization bill that did not pass), and a quarter is river water treated for industrial facility use. The significance of the global seawater emphasis bears investigation.

Of course, power plants and commercial applications can and do fund desalination themselves. Their efforts and that of states imply sufficient scope to supplant the need for the federal research called for in desalination campaigns, since the only other primary use is water supply, which ought not be achieved through such a costly method to mask scarcity. Better for the water to cost more and reduce demand and usage.

The Case for Markets: Avoid Having Government Steer While the Market Rows

Overly abundant taxpayer funding of scientific and manufacturing research is incompatible with a future of optimally and lightly regulated science and manufacturing specifically, or with limited government generally. This observation is not a maxim because the reader is likely to encounter it in few other places, but it holds water, so to speak. With desalination legislation, we already observe the seeds for new regulation created by the direct impacts, indirect impacts and externalities of desalination itself.

Moreover, there are opportunity costs to governmental funding of technological research. Politics cannot determine optimal research portfolios: Why politicians' preferred brackish groundwater desalination instead of seawater?; Or, for that matter, why not investment in pipelines for transport parallel to the Keystone XL or other potential corridors from the Great Lakes; or repair of leaky infrastructure; or water portage via cargo shipping?

¹⁵“Desalination: Technologies, Use, and Congressional Issues,” *Congressional Research Service Report for Congress*, Congressional Research Service, August 15, 2011. p. 2.

¹⁶Congressional Research Service, 2011, p. 3.

¹⁷Congressional Research Service, 2011, p. 2.

We can avoid the distortions and bubbles created by governmental investment undisciplined by markets. The dilemma is by no means special with regard to desalination. In other sectors, why might we witness a National Nanotechnology Initiative and a National Broadband Plan, instead of a biotech agenda? Why not space travel, robotic asteroid mining, or more dollars for fuel cells and the hydrogen economy? Why not one-wheeled SegWays? The point is, the proper emphasis for research is impervious to political resolution. Political dominance of production can and will create entire industries, even an economy, disconnected from actual consumer demands and preferences.

Of course, no political party is immune from channeling federal dollars to districts in defiance of scientific or economic merit. Problems arise when the federal government heavily involves itself in the very production of knowledge itself rather than in laying the legal, property right, and contractual foundations of such new commercial endeavors, such as protecting intellectual property rights that expanded knowledge generates.

Desalination is a special case, but it captures and illustrates how government-centered science policy spawns artificial conflicts over:

- The fundamental merit of basic vs. applied research
- The impact of private vs. public funding on discovery and progress
- The alleged objectivity of government vs. “industry” science and the improper chastisement of industry science in the marketplace of ideas
- Potential confusions over the ownership or intellectual property status of federally funded research and discoveries
- Purported (but often exaggerated) conflicts of interest among federally funded scientists¹⁸
- The more general right to not fund projects with which one disapproves

Policy ought not to disconnect science from the voluntary market process. Science can advance human welfare and remain most relevant when pulled into being by the actual needs of mankind, including practical ones; we see that occurring in private-sector investment in desalination as opposed to taxpayer funded.

To advance desalination technology, Congress continually revisits the question of what the federal government should be doing; but rather than embrace the invitation to expand spending on scientific endeavors (obviously Washington can’t fund them all), Congress

¹⁸ Iain Murray, “The Nationalization of Basic Science: Overzealous Attempts to “Protect” Scientific Integrity will Damage American Science as a Whole, *CEI OnPoint No. 100*, July 21, 2005. <http://cei.org/pdf/4696.pdf>.

should foster private research rather than appropriate funds or steer research and investment.

Adding to the thousands of subsidies in existence shouldn't necessarily be regarded as promotion of science and technology. A bit of the "broken window fallacy"¹⁹ comes into play here: we may see the desalination demonstration project's ceremony and ribbon-cutting, but not seen is the science and wealth not created thanks to the redirection of resources.

Bolstering manufacturing and science requires vigorous competition among ideas for private funding. The national government's role in actually fostering such knowledge wealth is limited, but its role in liberalizing the American economy so that *others* can foster that wealth is a profound responsibility, perhaps the primary duty of government.

Furthermore, it is not proper for the sciences and practical applications of them to proceed walled off from one another in a legislative appropriations environment, as proposed with desalination and seemingly everywhere else (for example, as exemplified in the America COMPETES Act²⁰). When governments set the agenda it undermines the swirling competition, cooperation, and "co-opetition" needed for U.S. economic health, such as hypothetical alliances with other network industries for, say, water transport instead of desalination.

Outcome-oriented desalination interventions as opposed to broader liberalizations that leave outcomes up to the choices and dispersed knowledge of others will produce prominent successes that cheerleaders can point to, but fall short taken as a whole and compared to the potential. Interventions, subsidies, and regulations create an economy made up of suboptimal entities and approaches that don't resemble what they would under free enterprise. Those inefficiencies will propagate throughout the economy and over the years.

Rethinking Policy: Alternatives to Desalination as Water Supply Augmentation

Desalination at bottom is an energy-intensive, by-product-laden means of making expensive potable water. As CRS notes, given its energy intensity, more expensive electric power is a factor undermining its prospects. Higher electricity prices would cause "less electricity-intensive" substitutes like conservation, water purchases, and pricing changes to rise in relative importance.²¹ Some alternatives to Desalination Act-style policies follow but are by no means exhaustive.

¹⁹Read about it in Frederic Bastiat, "That Which is Seen, and that Which is Not Seen," 1850.
<http://bastiat.org/en/twisatwins.html>

²⁰ <http://www.nsf.gov/statistics/about/BILLS-111hr5116enr.pdf>

²¹ Congressional Research Service, August 15, 2011. p. 3.

Better Pricing of Existing Water Supplies

We've noted the lack perspective on the value of water.

As Adam Smith and the classical economists teach, water and diamonds have vastly different marginal and total utilities.²² Each can be worthless or priceless under different circumstances. Both the supply side of life and the demand side of life matter across the board.

Water utilities are usually sourcing-to-delivery monopolies, rarely subject to market forces. Problems with efficient investment exist in such models, as do disincentives of local elected officials to tolerate the rate increases that a market would dictate and perhaps implement instead of possible detours like desalination.

The state of play is reviewed in books like *Water Markets: Priming the Invisible Pump* by Terry L. Anderson and Pamela Snyder, which surveys water law and how water markets have emerged in the United States, "including discussion of the restrictions by state and federal governments, which increased over the past century."²³

Steve Maxwell in *The Future of Water* makes an important note about our delusional attitude toward the miracle of easily available fresh water: "The most important job utilities around the world may have in the coming decades is convincing people that water is valuable—and that it is reasonable to pay more for this luxury than the bargain prices we have traditionally taken for granted."²⁴

In reviewing top water expert and researcher David Zetland's book *The End of Abundance*, G. Tracy Mehan summarized: "[T]he water sector can encourage better stewardship and a greater degree of social harmony by substituting pricing and market allocation of limited water supplies for political management."²⁵

Water isn't unique in widespread inefficient pricing and allocation, of course: anything politically or bureaucratically managed is vulnerable to quantity and pricing shocks and constraints. Where water prices are artificially low, shortages will result. The chapter

²²See also G. Tracy Mehan III. and Ian Kline's reference to the same in "Pricing as a Demand-Side Management Tool: Implications for Water Policy and Governance," *Journal of the American Water Works Association*, February 2012. pp 61-66.

²³Terry L. Anderson and Pamela S. Snyder, "Priming the Invisible Pump: Water Markets Emerge," *PERC Policy Series No. 9*, February 1997. Property and Environment Research Center, <http://www.perc.org/articles/article198.php>

²⁴Cited in Mehan, May/June 2012.

²⁵Mehan, May/June 2012.

“Why Water Crises?” in *Water Markets: Priming the Invisible Pump*, by Anderson and Snyder, describes the price mechanism’s essential role in preventing crises:²⁶

Higher water prices would also reduce the need to build costly supply projects and delivery systems that dam and divert free-flowing streams. Higher prices would encourage private, profit-making firms to enter the water supply industry, taking the burden off the public treasury. If the price mechanism were allowed to operate, demand could be reduced, supply could be increased, water would be reallocated, and water crises would become obsolete.

They don’t specifically mention desalination as one of the “costly supply projects,” but one can see that these price signals themselves are necessary to know when de-salting is the proper course rather than alternatives. Proper pricing is an “alternative” to desalination in that sense.

Similarly, David Zetland notes that “Shortages can be ended much more quickly by a change of incentives than supply-side actions to build a desalination plant or transfer water from neighbors who probably can’t spare a drop.”²⁷

Politically expanding a fundamentally scarce and poorly priced supply of a resource like water in less-blessed places seems to have entrenched artificial new problems. Desalination and other supply techniques can encourage difficult-to-sustain migratory and settlement patterns. Such perverse incentives echo the policy of federal flood insurance for continuously building on hurricane-prone areas after consecutive knock-downs. Policymakers shouldn’t use desalination or other supply techniques as a means of making it artificially attractive for more people to move into areas like arid regions. That would be illegitimate public policy and perverse justification for legislation, and worse, would sow the seeds “necessitating” more legislation years hence. It would make desalination a necessity rather than merely one profit-driven option among many.

Reduction of Water Waste and Improved Contracting

Another “alternative” to desalination alongside better pricing is to avoid wasting existing supply. Bonner Cohen notes that leaking pipes alone cost 17 percent²⁸ of the annual water supply:

Water main breaks and leaking water supply pipes cost American taxpayers billions of dollars every year in lost water and repair costs. Necessary upgrades

²⁶Terry L. Anderson and Pamela Snyder, *Water Markets: Priming the Invisible Pump*, Cato Institute: Washington, D.C., 1997. p. 11.

²⁷David Zetland, *The End of Abundance: Economic Solutions to Water Scarcity*, 2011. p. 6.

²⁸Cohen, 2012, p. 4.

*promise to place additional stresses on taxpayers long into the future. Building and replacing water and sewage lines alone will cost some \$660 billion to \$1.1 trillion.*²⁹

Repairs (and price signals) can be cheaper than desalination. Cohen further notes that changing inefficient policies such as restrictions on PVC pipe use, and emphasizing competitive procurement bidding for crumbling underground infrastructure,³⁰ and particularly privatization, can save great sums.³¹ Such forms of non-market inertia make ordinary infrastructure more costly than it needs to be and may improperly inflate the appeal of costly desalination.

Infrastructure Advances and Other Innovations as Substitutes for Desalination

Non-market-priced municipalities that attempt to sell water at average cost by their nature compound the problem of rational adoption of expensive desalination: As David Zetland put it, desalination “will merely result in greater financial losses from selling more water below cost and do nothing to prevent shortage.”³²

The pricing of regulated-utility water will frequently diverge from the optimum, compounding allocation and availability problems over time. In any event, without advocating for any particular alternative to desalination, and while stressing the underlying issue of water’s character as a non-competitive, non-market enterprise out of sync with the modern world, other infrastructure expansion approaches could be more appropriate. These include:

- Better transport, including pipelines/aqueducts/trucking/shipping: Transport can be cheaper than desalination. Advances among these matter and change economics drastically, particularly if other network industries with rights of way collaborated far more than they do today.³³ Crude oil carriers can be converted to water carriers.³⁴
- Trade: Relatedly, trade allows for coping with competing priorities and grappling with scarcity. G. Tracy Mehan for example notes that “[E]merging water markets allow...for trades between cities, farmers, and even NGOs such as Trout Unlimited.”³⁵

²⁹Cohen, 2012, p. 3.

³⁰ Cohen 2012.

³¹ For example see Leonard Gilroy and Harris Kenny, Annual Privatization Report 2010: Water and Wastewater, Reason Foundation, May 2011.

http://reason.org/files/water_annual_privatization_report_2010.pdf

³²Zetland, *The End of Abundance*, 2011, p. 18.

³³See introduction in Adam Thierer and Wayne Crews, *What’s Yours Is Mine*, Cato Institute: Washington, D.C. 2003.

³⁴ Noted in Wikipedia’s entry on desalination, <http://en.wikipedia.org/wiki/Desalination>.

³⁵Mehan, May/June 2012.

- Gray/wastewater treatment and reclamation is an alternative for sourcing, for agriculture and industry if not for drinking, taking pressure off the latter.
- Improvements in stormwater harvesting techniques.
- Conservation: Anderson and Snyder in *Water Markets* note that “Markets are providing agricultural and urban users with more reliable supplies and with an incentive to conserve, and are enabling environmentalists to purchase instream flows to protect fish and recreational opportunities.”

President Obama and others have suggested a desire to boost antitrust enforcement.³⁶ That’s unfortunate. Antitrust can be predatory. Instead, policymakers should relax antitrust so that firms within and across industry sectors can collaborate on business plans to bring capitalism and infrastructure wealth creation to a higher level, including water infrastructure.

The antitrust laws remain a significant barrier to a flowering of cooperative business efforts and private R&D. It is precisely in tech industries that private standard setting, joint research and risk sharing arrangements might overcome alleged market failures in basic research output and difficult technologies like desalination. Yet some would block such arrangements, as well as mergers among firms engaged in like research. Markets require competition, sometimes merger, and sometimes merely the kind of cooperation or “partial merger” often miscast as damaging collusion.

Respecting and Enhancing Legitimate Market Pressures for Desalination

The need to avoid artificially promoting desalination in areas that the market and proper pricing wouldn’t have created demand for the procedure has been emphasized. David Zetland’s *The End of Abundance* encapsulated some of the hurdles:

*Desalination is one of the most expensive ways to get freshwater. The capital costs of the plant, pumps and pipes are significant. Operating costs (energy and filters) depend on salinity, energy source, plant technology, filter technology and other factors. Environmental costs from the entrapment/entrainment/impingement of sea life harmed or killed by suction at intake pipes and saline discharge are important.*³⁷

Nonetheless, desalination would greatly benefit from a friendlier market environment. As for legitimate market pressures, some applications naturally and justifiably rely on desalination, such as ocean going vessels and resort properties. Moreover, technologies once expensive often come into their own, as did hydraulic fracturing, or fracking.

³⁶http://www.nytimes.com/2009/05/12/business/economy/12antitrust.html?_r=1&adxnnl=1&adxnnlx=1268514088-MohE/8/mpcqIAEXJNqJIJQ.

³⁷Zetland, *The End of Abundance*, p. 128.

Autonomous viability is the root of any conversation about sound usage and market adoption of desalination.

Limit Regulatory Burdens

Permitting and other regulations that can make it an overly difficult process to construct and operate desalination plants should be reviewed and relaxed,³⁸ particularly since legislation often would paradoxically promote regulation of the technology and its byproducts. (See options for general reform of regulatory policy in the Appendix.)

Unleash Affordable Energy

For desalination to proliferate, proximity to seawater and energy matter, of course. Great improvements in desalination's viability arguably could be had via co-location with power plants such as nuclear and coal. Those alone could do far more than any legislation, but appear off the table given broader anti-energy public policies.

Indeed, nuclear, coal or other co-generation could be needed for scale. While desalination costs have dropped over decades, they remain vulnerable to electricity prices, and remain very high regardless of cheap power. There is no workaround for the fact that federal policies disdainful of conventional energy are inconsistent with the presumed goal in proposed federal legislation of advancing desalination. (A recent failed reauthorization of the Water Desalination Act that sought to prioritize renewable energy would have compounded expensive water with expensive input energy to create it. That element is not contained in H.R. 745, but the inclinations for such campaigns persist, and one can be certain that pressures to embrace renewable energy would re-emerge.

Reducing onerous energy regulations would reduce economic uncertainty, making desalination more attractive. But reducing such uncertainty would also make conventional energy and water production attractive, too. Affordable energy in that sense belongs in the necessary-but-not-sufficient category when it comes to rational desalination.

Supply Reliability

Apart from water source and energy, perhaps the single most important circumstance to justify adoption of desalination processes would be that the water source in need of

³⁸ "Substantial uncertainties remain about the environmental impacts of desalination, which have led to costly permitting delays." The National Academies' Water Information Center, Desalination: A National Perspective, 2008. http://dels-old.nas.edu/water/dyn.php?link_id=5291&session_id=0kqg3jkjuqrkq740sim7g15b77

desalination is independent from and more attractive and reliable than all alternative fresh sources such as those rooted in precipitation, runoff, and aquifer recharge.³⁹ But these are local characteristics that, if not sufficient to inspire private adoption of desalination, should be the concern of local or regional authorities rather than the population beyond. The federal government (and taxpayers) need not be involved.

Appreciating Water Purification as a Business Venture

Businesses do invest in desalination technology. The number of legitimate market-driven desalination techniques is surprising, well beyond what the current federal legislative proposal seems to appreciate. So is the number of well-known firms: It includes Lux, Siemens, GE,⁴⁰ and others.

Private desalination investment outstrips public investment and is subject to market discipline. Public and private investment overseas where the incentives line up differently probably inform domestic policy better than anything legislation could do.

Desalination at bottom is one category of purification; some industries require even higher purities of water than desalination would create, conduct substantial research, and pay the price to achieve purity. Water augmentation, driven by industrial needs, is where the advances are most likely to be most efficient and broadly informative. Lessons from this sweep of experimentation are transferable and more on point than conventional desalination legislation.

Most of us just want water to come out of the tap. As costs come down, as regulation is streamlined and as inconsistent energy policies are harmonized, perhaps desalination could represent a highly attractive, perhaps non-depletable, source of water. And if costs decrease, there's no need for subsidy and the Desalination Act.

As it stands, the realities of non-scarcity pricing of water and of permitting and approval barriers seem to defy the vision of desalination legislative instruments. As David Zetland puts it in a hypothetical context regarding supplying California's municipal needs via desalination:

But if it's possible to get approval for this kind of project and raise prices so far, why not just raise prices and skip the project? Higher prices would leave more water for nature, save a lot of money, and still leave humans with adequate

³⁹CRS, 2011, p. 2.

⁴⁰Descriptions of techniques appear on GE's website, "Desalination: Reliable fresh water supplies from challenging water sources." http://www.gewater.com/what_we_do/water_scarcity/desalination.jsp

*supplies.... [T]he policies affecting supply and demand are more important for ending shortages than technology.*⁴¹

We need competitive markets to discover not just desalination's real value relative to the entire range of alternatives, but the value of water itself.

In listing alternatives to desalination above, the importance of broader markets in infrastructures was highlighted. Innovation and basic research itself do not proceed in isolation in genuine markets. Economic sectors can inform and enrich one another, making it advisable to tear down regulatory silos artificially separating infrastructure industries wherever possible so that knowledge, ideas, products, and collaboration—and water—flow more freely.

Desalination in Context with Federal Technology R&D

Desalination is but a drop in the larger bowl of technology R&D policy itself. We touched upon the desalination policy environment earlier; this section considers desalination technologies in that broader policy environment which congressional committees so heavily influence, and underscores the importance of market processes.

Federal Control Can Mean “Sub-Prime” Technology Policy

Normally, America urges developing nations to embrace markets and reject government-steering philosophies for enterprises like growing wheat or making shoes. Yet we enable government oversight of advanced networks and infrastructure at home, such as water, the Federal Communications Commission's National Broadband Plan and net neutrality rules, and the heavy regulation of electricity.

As a free society becomes wealthier, creation of infrastructure for needs like water becomes easier, not harder. The America of 100 years ago that built overlapping, tangled infrastructure with a developing-world-level GDP can build today's, if allowed. Well-functioning capital markets already *are* our “infrastructure bank.” Yet unsurprisingly, in the policy environment that includes this legislation, desalination has been considered as a target for infrastructure bank financing techniques.⁴² Energy infrastructure, communications infrastructure, electricity infrastructure, the infrastructure capabilities of desalination—all would benefit far more from a concerted deregulation and liberalization campaign than government spending and research. Pushing politically favored infrastructure projects while leaving 19th and 20th century infrastructure and antitrust regulation intact, undermines the goals of legislation like the Desalination Act

⁴¹Zetland, *The End of Abundance*, p. 183.

⁴²CRS, 2011, p. 2.

reauthorization. (The Appendix, “Economic Liberalization: An Alternative to Government Spending In Service to Water Abundance” presents such an outline.)

Government steering and subsidies can offload technologies onto inefficient paths, and can generate artificial booms. One lesson of the telecom meltdown is that government can contribute to the inflation of unsustainable technology and research bubbles; we may be at risk of a similar “green technology” bubble now.⁴³

A subsidy for an unproven or emergent technology can be thought of as a pre-bailout. There’s no way to do every project; everybody has competing priorities. Few know many details about every competing option, and subsidies get a pass: there are thousands of projects in hundreds of legislative districts.

We are not best served by an environment of researchers chasing politically favored fads and designing grant requests in response to political trends, whether biofuels, energy conservation, smart grids, politically favored medical research—or desalination or other forms of water treatment and augmentation. President Eisenhower warned in his 1961 Farewell Address of the risks of researchers designing proposals to link to politically fashionable themes:

[P]ublic policy could itself become the captive of a scientific-technological elite...Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity...The prospect of domination of the nation’s scholars by Federal employment, project allocations, and the power of money is ever present—and is gravely to be regarded.⁴⁴

Desalination is small potatoes compared to that, but the essence is the same. Note again that federal legislation currently artificially favors use of renewable energies, precisely the kind of distortions being noted here. Regardless, we have a regional or state issue on our hands, not a federal one.

Government Funding Has Strings Attached

Under a Republican administration, Washington passed the bipartisan 21st century Nanotech Research and Development Act in 2003 to provide nearly \$4 billion to establish numerous research grants for nanotechnology initiatives, set up nanotechnology agencies, programs, subsidies, and steer students toward nanotechnology research.

⁴³Spain’s King Juan Carlos University released findings that each “green job” created by the Spanish wind industry cost 4 other jobs elsewhere. “The Big Wind Power Cover-Up,” *Investor’s Business Daily*, March 12, 2010. <http://www.investors.com/NewsAndAnalysis/Article.aspx?id=527214>

⁴⁴Eisenhower’s Farewell Address to the Nation. <http://mcadams.posc.mu.edu/ike.htm>.

Federal agencies simultaneously positioned themselves to regulate risks of nanotechnology, not necessarily to the good. Reports from the Environmental Protection Agency⁴⁵ and the Food and Drug Administration⁴⁶ call for substantial roles for regulatory bodies to govern nanotechnology endeavors.

Government funding typically invites such regulation. Regulatory concerns over desalination are pointed to by the CRS, and desalination legislation's own design seems to welcome government regulatory oversight of the technology as if private alternatives were unthinkable. The thrust will be that government should fund desalination and study (endlessly) its risks. Since recipient businesses and contractors can become so dependent on political funding, they go along with the oversight, cut off from envisioning alternative approaches to either securing funding or managing hazards.

Fundamentally, we face the choice of treating frontier research, development, and production of everything from nanotech to desalination as market enterprises and requiring them to demonstrate both financial feasibility and safety in the marketplace, or suffer their being regulated at every stage and their economic potential squelched, without necessarily gaining safety or other benefits in the exchange.

The drive to regulate safety isn't only undermining wealth creation in science and manufacturing, but threatens the emergence of needed safety and disciplinary practices. It's important to avoid safety regulation that either inadvertently or deliberately preempts superior discipline. Policymakers' "safety" regulation can exacerbate risks of new technologies by unleashing them before their time.

Meanwhile, while political funding comes with strings attached on the one hand, the circumstances accompanying funding can indemnify companies for the hazards they create on the other. Homeland security technologies like gas masks, for example, may be indemnified in the event they fail; proposed cybersecurity legislation would indemnify firms in the event of certain data breaches (while markets perhaps would not); The Price Andersen Act artificially limited nuclear power plant liability but was accompanied by total regulation. A market-oriented development path might have made nuclear power more viable over the past decades, but we'll never know.

Naturally, we must defend against risks but also avoid over-regulation of frontier sciences' practical applications. Political funding increases pressures for that regulation.

Political Failure Overwhelms Market Failure in Basic and R&D Investment

⁴⁵U.S. [Environmental Protection Agency's "Nanotechnology White Paper"](#)

⁴⁶[Food and Drug Administration's "Nanotechnology"](#)

The case for taxpayer funding of science and favored manufacturing is often based on the market failure argument. Supposedly, research creates value not easily captured, rivals free ride, and sub-optimal innovation results. Some also suggest an investment payback period intolerably distant for entrepreneurs, so the private-sector underinvests. Of course, rivalry itself is geared toward compressing the discovery-to-deployment phase.

Part of the misunderstanding here is a false dichotomy between basic and applied research. Regardless, price signals are needed to allocate scarce R&D resources to challenges that, once surmounted, would most reward innovators, advance human needs, and increase rates of technological progress and job creation.

For public funding, the absence of a residual claimant capable of aspiring toward windfall returns undermines the political appropriations environment's ability to manage resources. On the other hand, private investors can rationally invest in a range of low probability projects—like GE's desalination projects—counting on the profits from the rare success to offset the more typical failures.

Taxpayer funding can create other complications like patent disputes between university and corporate collaborators over control of future profits, the rights of taxpayers to the spoils, and access to research results or data by competitors or the public. An example is the dispute over the ownership status of genetic discoveries or basic molecular information. Pharmaceuticals routinely face compulsory licensing threats globally. Public funding also can create avoidable conflict-of-interest disputes when government scientists interact with private ones.⁴⁷ We do not want interventions to undermine the willingness to undertake private research in desalination.

Policy should avoid political failures created by public funding, which can exceed the "market failure" excuse typically used to justify such funding. And policy should legitimize the private-property status of new forms of wealth and avoid policies that delay these underlying institutional innovations.

As for the claims of market failure/private underinvestment, the expansion of government-funded science doesn't help if the metric is the proportion of a nation's GDP devoted to R&D. Research by scientist Terence Kealey suggests that the private sector funds basic research out of competitive necessity in a global economy and that total R&D expenditures tend to correlate to GDP rather than to particular national policies.⁴⁸ In other words, where government R&D is low, the private sector simply invests more. Higher GDP begets higher R&D. Substitution and tradeoffs mean taxpayers gain little from

⁴⁷ Rick Weiss, "NIH Bans Collaboration With Outside Companies: Policy Comes After Conflict-of-Interest Inquiry," *Washington Post*, September 24, 2004; Page A23.

⁴⁸ See, for example, Terence Kealey, "End Government Science Funding," Cato Institute, April 11, 1997. http://www.cato.org/pub_display.php?pub_id=6168.

increased political R&D, and may lose a lot because of the inefficiencies, sub-par policy and anti-competitive political choices. A wealthier society will invest more in rational desalination.

Politicians Can't Choose Technologies Rationally, and There Are Alternatives

The supporters of federal desalination research and projects tend to be from states that would directly benefit, but of course that's the case with many government programs. Except when a local earmark or project is at stake, politicians commonly accept that government has no innate ability to pick among competing technologies using taxpayer money. Moreover, government plans operate on an election timeline that doesn't conform to market schedules, undermining efficient execution by governmental bodies on research, development and construction efforts on desalination.

Politicians cannot assign rational priorities to the stream of "significant" projects, thus they will select popular ones benefiting local constituencies; simply note the continuing funding of new libraries in the digital age (as opposed to, say, handing out wireless-enabled laptops), new post offices, and clamoring over tech programs for rural small businesses. In technology funding, scientific merit may be underwhelming, but the rhetoric of science and technology are guaranteed.

The hazards of a government appropriations process and the accompanying lobbying for sub-optimal projects are numerous. In the space program, entrenched contractors and legislators from flight-center districts enjoy cost overruns, and lobby against cheaper unmanned flights. An ethic of revolutionizing space flight becomes unthinkable. There's no need to recreate or perpetuate such a situation in water policy or any realm.

In the federal R&D sweepstakes, bolstering promising technologies has been compared to efforts to improve the speed records at a racetrack by picking the R&D horses to run—in the case of recent congressional proposals, desalination vs. everything else.⁴⁹ Beyond the technologies for generating clean water, however, the condition of that racetrack and the rewards available also matter. Greater "speeds" might be had by improving the track—the business and regulatory environment—and by letting "jockeys" (private investors) keep more of their earnings.⁵⁰

⁴⁹ The horse and track analogy appears in Fred L. Smith, Jr., Testimony before the Subcommittee on Energy and Environment, House Committee on Science, Hearings on the Fiscal Year 1999 Budget. March 24, 1998. <http://cei.org/outreach-regulatory-comments-and-testimony/testimony-subcommittee-energy-and-environment-house-commi>

⁵⁰ Fred L. Smith, Jr., 1998. <http://cei.org/outreach-regulatory-comments-and-testimony/testimony-subcommittee-energy-and-environment-house-commi>

The government-picking-technologies model undermines economic liberty, innovation, wealth creation, “national competitiveness” (a frequent rationale for government R&D) and consumer benefits, and is itself a source of risk. Many have argued that viable technology doesn’t need a subsidy, and non-viable technologies probably can’t be helped by one. Otherwise, we distort markets, create bubbles and tee up future rippling recessions. Rather than picking the winning horses (or worse, the federal government actually *being one* of the horses, which worsens the situation with water policy), government’s legitimate role is to improve the track on which all the horses run; that means liberalizing the regulatory environment within which entrepreneurs operate, for starters (again, see the Appendix).

One aspect of liberalization must be privatization of federal research efforts rather than creating new ones as research legislation does (which itself would remove constituencies for government funding). The typical emphasis is on government spending rather than privatization. During the 1990s, it was proposed that essential military aspects of federal labs be transferred to the Department of Defense, while commercial aspects should be privatized by offering them to the industries they supposedly benefit or by allowing research staffs to take them over via an employee buyout approach.

Privatization of federal research is a particularly hard sell when the topic at hand is public funding expansion. Perhaps one approach is to limit federal funding for technologies that do not yet exist, and grow out of the problem. In any event, a worthy idea noted in the 2010 discussions surrounding the America COMPETES Act was that of awarding prizes instead of funding research, the idea being that “Payment to researchers would reward accomplishments rather than promises.”⁵¹ In the context of desalination and more broadly, we note that option as a transitional alternative, not necessarily an end goal.

Taxpayer Funding Misdirects Resources by Prolonging Inefficient Projects

Markets have to be good at killing bad projects as well as at creating new ones.⁵² Governmental appropriations processes are less capable of systematic pruning.

The problem with government science is that virtually all interested parties seek to grow government rather than pull the plug on exhausted or ill-considered funding projects, from relatively tiny ones like desalination to the gargantuan like the Superconducting Supercollider. The result is higher taxation and dollars directed to multiplying, uncoordinated ends. Science resembles any other rent-seeking interest in this respect. In

⁵¹See Iain Murray, “A Wall of Separation Between Science and State,” *Competitive Enterprise Institute*, October 19, 2006.

⁵²Auren Hoffman, “To Grow a Company, You Need to Be Good at Killing Things,” *Summation*, February 21, 2010. <http://blog.summation.net/2010/02/to-grow-a-company-you-need-to-be-good-at-killing-things.html>.

testimony before congressional panels, most ask for more money, not less; for more government rather than less government.

Taxpayers should call the shots. Other citizens have goals equally as legitimate as those with the wherewithal to procure lobbyist representation in Washington or to appear at a hearing.

In proposing an end to the Advanced Technology Program years ago, Michael Gough offered a real test of taxpayer support: “Let the government give taxpayers who want to invest ... a deduction from their income ...[and] share in any profits that flow from it. That’s what taxpayers get from private investments. It’s not what they get [when government] takes tax money...and invests it in private enterprise.”

Environmental Concerns

Environmental impacts of subsidized desalination, such as the impact on aquatic creatures and the uncertainty over numerous options for disposal of waste streams, are the very types of impacts that in other contexts like pipelines and fracking are deal breakers.

Also the peculiarities of the source water used in desalination are used to justify expanding regulations. Government fostering of desalination technology will carry with it an advanced, open ended regulatory regime.

The CRS notes that “current desalination processes are already operating close to the theoretical minimum energy required.”⁵³ But desalination is inherently energy intensive compared to other options, and “dense” energy like cogeneration with coal or nuclear would seem to be worthy of consideration for emphasis instead. Note again that an earlier reauthorization effort specified that desalination funding be steered such that the technology is fused with expensive renewable energy sources. That stipulation doesn’t appear in the new bill.

Free enterprise can excel at managing risks of desalination intake concerns and its waste streams. In normal markets, before firms can attract investors and launch, disciplinary institutions like liability and insurance must be secured. One must satisfy many stakeholders, including capital markets, insurers, upstream business suppliers, horizontal business partners, downstream business customers, consumers, public and global markets. One must not pollute a neighbor’s property.

Markets should, and do, bring highly risky products forth. But government promotion, subsidies, and indemnification can short circuit the risk-mitigating disciplines that must

⁵³CRS, 2011, p. 4.

emerge alongside the new. That can give emergent industries an undeserved black eye and foster counterproductive regulation and less innovation.

Conclusion

Desalination policy suffers from the premise that government-directed coordination is automatically preferable.

In an alternative scenario, private innovators might pool efforts, and in so doing make risky or uncertain technology a better target for investment. America's great infrastructure firms are artificially segregated into regulatory silos (telecommunications, electricity, water, sewer, cable, railroad, airline, satellite, air traffic control, roads). In a free market, they could collaborate to expand infrastructure wealth development, but it would require a mindset wholly different from the constricted legislative one that sets terms today.

Occasionally the problem confronting research isn't market failure but the failure to have markets. "Doing something" about legitimate water needs is not the same as spending money and initiating governmental research and demonstration projects. When linking research to human needs and promoting infrastructure, capital markets trump the legislative process—or, if not, policy should shift to ensure that they can.

Interestingly, the dollars allocated in the various federal desalination acts over the decades seems to total perhaps a few billion. But removing barriers to private research and manufacturing could yield far greater gains than relying upon appropriations that invite rent-seeking and that may threaten safety and environmental improvements. Government's proper stance is one of benevolent indifference or neutrality, since many technologies, most not in existence yet, will always compete for scarce investment dollars whether the projects are small scale or grand infrastructure.

Congress has a far more important job to do that it can't escape by sprinkling cash around. As discussed in *Still Stimulating Like It's 1999: Time to Rethink Bipartisan Collusion on Economic Stimulus Packages*,⁵⁴ there exists a natural tendency toward stagnation when government fails to perform its "classical" function of ensuring that prices of materials, labor and other inputs aren't distorted by interference in the economy.

With water supplies, we have, not a funding problem, but a larger resource mismanagement problem. As David Zetland summarizes in *The End of Abundance*:

⁵⁴ Wayne Crews *Still Stimulating Like It's 1999: Time to Rethink Bipartisan Collusion on Economic Stimulus Packages*, Competitive Enterprise Institute, February 2008. http://cei.org/cei_files/fm/active/0/6425.pdf

The end of abundance means the supply side/cost recovery model of water management no longer delivers the results we want, but that model still dominates the business—from California to China, Florida to Fiji—and it will cause trouble until we change the way we manage water. Economics offers an alternative focus on balancing supply and demand.⁵⁵

Markets expand output in tangible products and intangible services. They also help maximize the production of useful information—including research and scientific information about technologies whose applicability is uncertain yet holds promise.

The task is to bring modern water resources further into the market process, and to lay the groundwork for tomorrow's discoveries and advances to be informed and funded by market rather than political processes. Reauthorizing federal water desalination projects would do the opposite in many respects. In a sense, as this report describes, it will take legislation of a different form to address the underlying problems in water supply.

⁵⁵Zetland, *The End of Abundance*, p. 6.

Appendix: Economic Liberalization -- An Alternative to Government Spending in Service to Water Abundance

We've noted some specific hazards of government steering the market. We need alternative approaches—other than federal spending—to advance science and manufacturing, of which desalination is an example. Such approaches involve fostering a general business environment wherein a private sector flush with health can fund its own research and ventures. There is a need for cataloging and limiting federal over-regulation to foster a wealthier economy, one capable of carrying out an array of research regimes with less temptation to seek an ear in Washington.⁵⁶

Sunset Regulations and Implement a Regulatory Reduction Commission

More than 60 departments, agencies, and commissions issue some 3,500 regulations a year in thousands of *Federal Register* pages (documented in *Ten Thousand Commandments: An Annual Snapshot of the Federal Regulatory State*.⁵⁷) Costs of regulations are estimated to top \$1 trillion annually. Congress should implement a bipartisan “Regulatory Reduction Commission” to survey existing rules and assemble a package to eliminate with a straight up-or-down vote, no amendments allowed.

Require Congressional Approval for Major Business Regulations

Of 3,500 annual regulations, 100 plus are “economically significant.” These rules should require an expedited congressional approval before they are effective. Apart from the competitiveness and innovation issues at issue in legislation, the delegation of legislative power to unelected agencies has long needed attention.

Perform Basic Deregulatory Housekeeping

- Re-discover federalism, that is, circumscribe the federal role regarding investment and regulatory matters best left to states and private enterprise. Congress should look at what the federal government does that it could eliminate, or that states could do instead to provide a research and manufacturing boost.
- Improve the ethic of quantifying regulatory costs and selecting the least-cost compliance methods.
- Codify the executive order on “Regulatory Planning and Review” (E.O. 12866), or, Reagan’s E.O. 12291, which provided for more external review.
- Require OMB’s Regulatory Information Service Center to publish details on major and minor rules produced by each agency and strengthen its oversight.
- Reinstate the *Regulatory Program of the U.S. Government*, which formerly appeared routinely as a companion document to the Budget.
- Declare *Federal Register* notices as insufficient notice to small business
- Hold hearings to boost the scope of the Small Business Administrations’ “r3” regulatory review program.

⁵⁶ More detail on the suggestions here appear in Wayne Crews, “The Other National Debt Crisis: How and Why Congress Must Quantify Federal Regulation,” Competitive Enterprise Institute, Issue Analysis 2011 No. 4. <http://cei.org/sites/default/files/Wayne%20Crews%20-%20The%20Other%20National%20Debt%20Crisis.pdf>

⁵⁷ <http://cei.org/sites/default/files/Wayne%20Crews%20-%2010,000%20Commandments%202011.pdf>

- Lower the threshold at which a point-of-order against unfunded mandates applies.
- Implement a supermajority requirement for extraordinarily costly mandates.
- Lower the threshold for what counts as an “economically significant” rule, and improve explicit cost analysis.
- Explore, hold hearings on, and devise a limited “regulatory budget.”
- Establish an annual Presidential address or statement on the state of regulation and its impact on productivity and GDP.
- Sunset regulations after a fixed period unless explicit reauthorization is made.
- Publish data on economic and health/safety regulations separately
- Disclose transfer, administrative, and procedural regulatory costs
- Explicitly note indirect regulatory costs
- Require agencies and the OMB to recommend rules to eliminate rules and to rank their effectiveness
- Create benefit yardsticks to compare agency effectiveness

Implement Annual Regulatory Transparency to Accompany the Federal Budget

In attempting to implement economic liberalization for the wealth-creating sector, a “Regulatory Report Card” should be part of the basic housekeeping just noted.

Regulatory Transparency Summary ...with five-year historical tables...

- Total major (\$100 million-plus) rules and minor rules by regulatory agency
- Numbers/percentages of rules impacting small business
- Numbers/percentages featuring numerical cost estimates
- Tallies of cost estimates, with subtotals by agencies and grand total
- Numbers and percentages failing to provide cost estimates
- Federal Register analysis: pages, proposed, and final rules by agency
- Most active rule-making agencies
- Rules that are deregulatory rather than regulatory
- Rules that affect internal agency procedures alone
- Numbers/percentages required by statute vs. rules agency discretionary rules
- Rules for which weighing costs and benefits is statutorily prohibited
- Detail on rules reviewed by the OMB, and action taken