



**PENN PROGRAM ON  
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**Regulatory Excellence:  
Lessons from Theory and Practice**

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Regulatory excellence has many facets. But what constitutes “best practice” in the governmental domain has been underpinned by too little theory and not much analysis of practice. In this paper, I try to rectify both gaps. I introduce a framework about what should matter in pursuing good governance in the regulatory arena drawn from the scholarly literature, most notably from the field of management with an overlay from the realm of administrative law. I amplify this taxonomy of regulatory best practices with observations from my work in the business world (where there has been much more systematic focus on organizational excellence) and my recent government service as Commissioner of Connecticut’s Department of Energy and Environmental Protection (CT DEEP).

### **Management Excellence: Vision and Execution**

While regulatory excellence has been under-studied, there has been considerable work done in the private sector on the elements of management excellence.<sup>1</sup> Although business school scholars and management gurus all have their own lists of what is critical, almost all agree that the fundamental requirements are *vision* and *execution*. I believe that the same core principles apply in the regulatory realm.

#### *Vision*

Business leaders spend a great deal of time defining their organization’s direction and “vision”– and often working with their management teams to spell this out in a mission statement.<sup>2</sup> Public policymakers should do the same. Too often, the direction of government agencies is defined by inertia. Without strong leadership that sharply focuses the work of a regulatory body, civil servants will do tomorrow what they did yesterday. So clarity of vision about the agency’s mission, core values, future direction, priorities and goals, and strategy emerges as the starting point for regulatory excellence.

I think that there is also a consensus that a “customer” focus – indeed, some would say *compulsive* attention to customer satisfaction and a commitment to listening to feedback – must be at the heart of any successful organization’s vision and culture.<sup>3</sup> Such a customer orientation – with a relentless focus on the needs of the public and the concerns of the regulated community – has not been at the heart of government practice, but should be.<sup>4</sup>

Most everyone in business recognizes the value of innovation and the need to constantly update and refine their strategies and tactics – and therefore their products, services, and business models. Government entities have been much less focused on this

transformation imperative. This too is a mistake. Regulatory excellence requires a deep commitment to continuous improvement and occasional fundamental restructuring. At CT DEEP, I made transformation of the state's environmental regulatory model the central focus of my tenure as Commissioner. As I discuss in detail below, we used a LEAN process (borrowed from manufacturing<sup>5</sup>) to completely re-engineer all 26 CT DEEP permitting programs and dozens of other agency activities.<sup>6</sup> This streamlining of operations allowed the agency to cope with significant human resource and budget reductions while delivering dramatic improvements in permitting speed, better targeting of limited regulatory resources to the biggest risks, elimination of a substantial backlog of pending permits, and greatly improved reviews from the regulated community.<sup>7</sup>

### *Execution*

Nearly every set of core principles of quality management puts a major premium on execution – implementing the business strategy to deliver against clear targets such as sales growth or improved profitability. Government needs to put the same priority on implementation.<sup>8</sup> Success should not be judged by laws passed, regulations written, treaties negotiated, budget growth, staff hired – or any other “input” metric. Progress must be gauged by changed behavior within the regulatory community and on-the-ground performance outcomes. For an environmental agency, for instance, success should be measured by improvements in air and water quality, chemicals or waste managed properly, or the level of greenhouse gas emissions in the atmosphere. Efficacy and efficiency both need to be part of this calculus.

Execution in any organization requires a number of strategy elements including strong leadership with a visible commitment to improved performance – and clarity about the need to do things differently and better. Almost every business has a sharp focus on delivering greater efficiency. Lower costs translate immediately into bottom-line results. Without profit targets, governments have not prized efficiency as much, but they should. The public's support for regulatory efforts varies with the perceived cost of regulations. When the burden is low, public support is easier to maintain. When regulatory costs are seen to be high relative to the gains, political and public scrutiny increases. One key to regulatory excellence is thus to reduce the regulatory burden without lowering standards. In this regard, regulatory bodies should pursue efficiency as a critical priority. Some of the same tools that the private sector has deployed -- such as re-designing operations for greater speed, efficiency, effectiveness, and transparency through LEAN analysis – should be more widely adopted in government.<sup>9</sup>

Communications is also critical to implementation and thus regulatory excellence. Transformation is hard to deliver under any circumstances, especially in government where there has been so little reward for doing new things. Clear marching orders from top management, particularly on the urgency of the transformation agenda, will be required. This reality is why so much emphasis in business is placed on creating a sense of a “burning platform,” which implies that there is no choice but to jump to something new and make changed practices succeed. Government leaders need to drive innovation just as hard and establish the same sense of urgency about transformation. Likewise,

there needs to be strong bottom-up information flow – both because successful change requires “buy-in” from the staff who will have to carry out re-engineered regulatory programs and other processes – and because the health of any organization depends on feedback (particularly bad news) getting from the staff to top management quickly.

The management literature almost universally emphasizes *people* as a critical input to organizational success.<sup>10</sup> This emphasis holds equal sway in government. Recruiting top talent is essential. And training (and re-training) at all levels of the organization will be fundamental to execution. Of course, even the best people will not be able to perform at high levels without adequate resources and technology support such as computers, video links, and access to online materials and databases. But governments often stint on these critical resources in the face budget challenges. At CT DEEP, with the Governor’s strong support, we committed new resources (even at a time of budget cuts) to staff training and the upgrading of IT and communications equipment in parallel with our LEAN transformation initiative. These commitments helped ensure that buy-in of the regulatory staff – and contributed significantly to the positive results achieved.

Getting alignment and commitment to the transformation required for excellence across a regulatory staff can be much more challenging than it would be in the private sector where foot-dragging can lead to dismissal. But every organization can establish appropriate goals, incentives, and rewards to drive execution. Quantitative metrics and benchmarking are useful in this regard both to judge individual performance and to gauge whether programs are delivering on their promise. In business, leaders are trained to be data-driven and tough-minded about what is working and what is not. Every day, they evaluate initiatives and double down on those that are delivering the best results. But they also know that they must make choices, and where programs are not producing the anticipated outcomes, they shut them down and redeploy those resources toward more promising strategies and projects. Government officials need to get better at “declaring failure” and redeploying scarce resources. Too often in a regulatory agency the *status quo* holds sway long after it is clearly not working.

Designing metrics for a regulatory agency takes more work than might be needed in a private sector entity, but the management benefits are just as significant.<sup>11</sup> Good data can help to identify best practices (which can then be disseminated more widely), flag underperforming groups, individuals, or managers (allowing top-management to prioritize them for transformation investments), and help develop materials that allow the agency to better “tell its story” to the public, legislators, and the media.<sup>12</sup>

### **Governmental Constraints**

While management principles offer a valuable starting point for what will be needed for regulatory excellence, the regulatory realm operates under some additional constraints. When one wields the power of the state, efficiency cannot be the only priority. Thus, regulatory agencies must carry out their work in ways that reflect respect for procedural fairness, distributional equity, political accountability, and checks and balances on the exercise of power.<sup>13</sup> Likewise, government must operate with special

attention to disciplines on corruption and self-dealing as well as lobbying and special interest manipulation of outcomes, all of which have been catalogued elsewhere and therefore will not be reviewed in depth here.<sup>14</sup> Suffice it to say that the elements of administrative law that produce good governance – notice and comment processes, open hearing and public participation mechanisms, obligations to publish draft decisions and explain policy choices, and structures for appeal or the cross-checking of outcomes – are in some tension with efficiency goals and other aspects of the framework of regulatory excellence outlined in this chapter. But they are essential to governmental legitimacy and must be upheld as prerequisites for regulatory excellence.<sup>15</sup>

## **Strategies for Delivering Regulatory Excellence**

Going beyond the private sector management literature and building on my own government experience, I identify below five additional components of regulatory excellence beyond the vision and execution focus highlighted above.

### *Integration*

Regulators are often called upon to fix market failures and to “internalize externalities” so that our economy functions efficiently and non-monetary priorities (such as safety or environmental protection concerns) do not get overlooked. They make decisions that define the terms of competition in the marketplace and impose significant (sometimes amounting to billions of dollars) costs on those they regulate. Getting the framework of decision making right therefore matters a great deal. Fundamentally, this means having a systematic and carefully constructed process for summing the costs and benefits of regulatory interventions. This formula turns out to be simple to say, but hard to do. There are many ways that the requisite calculus can get skewed.

Regulators need, in particular, to avoid “siloes” thinking. They must be sure to encompass all of the relevant costs and benefits and consider countervailing risks and impacts.<sup>16</sup> Those charged with reducing air emissions, for instance, must be sure that they don’t make water pollution worse. But sadly, this seemingly obvious rule is often ignored. Indeed, to reduce vehicle emissions in the 1990s, EPA required MTBE to be added to gasoline to improve octane and produce cleaner combustion – only later to discover that the additive caused severe water pollution.<sup>17</sup>

Regulators need to pay special attention to costs or benefits that are hard to capture because they are spread over time or space – or otherwise uncertain.<sup>18</sup> Some of the worst environmental regulatory failures of the 20<sup>th</sup> Century arose from the difficulty of capturing and managing slow-to-emerge or disaggregated harms – such as fishing practices that depleted fish stocks across the world or the build-up of Greenhouse Gas Emissions from millions of sources that now threaten to cause climate change.<sup>19</sup>

Regulators must be further trained to recognize tradeoffs and to take seriously opportunity costs. Simply put, money spent on toxic waste cleanup is not available for investment in sewage treatment systems. More fundamentally, a dollar spent on

regulatory compliance cannot be spent for business expansion, so public officials must be attentive to the efficiency of their rules and the economic burden (and competitiveness impacts) of the requirements they impose.

When Governor Malloy offered me the position of Commissioner of Connecticut's Department of Environmental Protection (soon to be re-configured as a Department of Energy and Environmental Protection), he told me that I was taking on the most reviled agency in the state government. The heart of the problem centered on the delay in getting permits issued and the sense on the part of the regulated community that the Department did not take seriously cost-benefit tradeoffs and the regulatory burden imposed on business. The mistrust these problems engendered colored everything CT DEEP did. In response, I told everyone at the agency that we needed to think of ourselves as "DEEEP" – committed to progress on *energy*, *environment*, and the *economy* simultaneously. This integrated agenda helped reframe how the staff understood their job, making it clear that regulatory progress depended on the agency being seen as attentive to regulatory costs and the state's economic growth imperative.

While the concept of "regulatory budgets," which limit the total regulatory compliance costs that a government can impose, have not taken off (and might not be a good idea), the willingness to pay for regulatory programs is not endless in the business world nor in the political domain.<sup>20</sup> As noted earlier, a smart regulator will not push the limits of the public's tolerance – and will ensure that efficiency is a watchword with regard to both the cost of administration (the government's regulatory expenditures and staffing, which translate into a tax burden) and the regulated community's compliance costs.

Signals from public officials about their seriousness of purpose when it comes to reducing the regulatory burden and cutting red tape are critical to a regulatory agency's credibility. The LEAN review of regulations across the board in the Connecticut Department of Energy and Environmental Protection (DEEP) that I led translated into faster processing times, reduced paperwork, and lower compliance costs, all of which produced significant goodwill in the Connecticut business community – and dramatically reduced criticism of the remaining regulatory requirements.

I also worked with the DEEP management team to identify outdated, outmoded, duplicative, and otherwise unneeded regulations and statutes – which we then convinced the CT General Assembly to repeal.<sup>21</sup> These "streamlining initiatives" paid further dividends. Business leaders were shocked. They claimed never to have seen a regulator repeal requirements wholesale. The value of convincing the business community that CT DEEP cared about the regulatory burden it was imposing and was seeking to minimize it meant that when the Agency did impose a burden, it got the benefit of the doubt that the costs were justified.<sup>22</sup>

## *Innovation*

Inertia is a powerful force in every organization, but especially in government where there is often little incentive to innovate. But regulatory excellence requires that systems be regularly reviewed and updated – and sometimes completely overhauled. When new policymaking tools emerge, the regulatory process needs to be re-engineered to take advantage of the advances that have become available. Innovations that are quickly implemented in the business world often move slowly into the governmental realm. For instance, the Information Technology Revolution which has transformed many aspects of society – how baseball teams pick their players,<sup>23</sup> how businesses advertise or market their products, etc. – has been very slow to take root in the policy domain.<sup>24</sup>

In this spirit, I put innovation and changed modes of operation at the heart of my vision for CT DEEP. I understood clearly that transformation was essential in light not only of perceived limits to the agency's past performance but also as an inescapable reality given the Governor's commitment to shrink the size of state government, which meant that I had to plan for staff attrition over three years of about 10 percent and an overall budget shrinkage of 15 percent. But thoughtful budget cutting turns out to be another critical element of regulatory excellence – and a crisis that can be converted into an opportunity. Specifically, budget cuts offer a way into the difficult conversation about priorities and which programs have outlived their usefulness as well as the need for transformed regulatory practices. Could Connecticut afford to spend 30 person-hours on each underground oil tank inspection? Not under the budget realities laid out by Governor Malloy. But it would have been hard to get the CT DEEP oil tank inspection team to shift to new ways of doing business (field inspectors using tablet computers and electronically transferring their reports to all those in headquarter who needed to review them for simultaneous action) without the “burning platform” of budget cuts and shrinking personnel counts. Today, those inspections each take about 4 person-hours to complete.<sup>25</sup>

The CT DEEP LEAN initiative required the staff who managed each process to lead the redesign charge, which some found burdensome but ultimately resulted in significant “buy-in” from those who were being asked to remake their own work lives. The results were dramatic. Permitting time dropped by an average of about 75 percent. The backlog of permits was reduced by 97 percent. And the Connecticut Business and Industry Association's annual survey of agency performance revealed a strong uptick in the business community's assessment of the agency's performance. Of particular note, these efficiency gains were achieved while maintaining environmental standards.<sup>26</sup>

Regulatory excellence in the 21<sup>st</sup> Century requires a real commitment to using IT tools and to delivering on the promise of “e-government.”<sup>27</sup> Where regulatory decisions once required a “paper file” to be reviewed by five different people within an agency, today an electronic file can be parallel processed by all five, cutting the time required for review by up to 80%.

Likewise, using the “turbo tax” model, government agencies can create “smart forms” that help those applying for permits get their applications filled out right the first time. The opportunity to bring best practices from the business world and from emerging academic theory (notably behavioral economics ideas such as “choice architecture” and default rules) has just begun to be tapped.<sup>28</sup> But the only way that these breakthroughs will penetrate is if agencies promote a culture of innovation.

Similarly, access to public information can be completely restructured in the Digital Age. Rather than keeping paper files and responding to Freedom of Information Act (FOIA) requests, it makes more sense to put all of the material that is in the public realm online so that people can find the files they want at anytime without coming to the Agency offices or getting help from Agency staff. This sort of innovation offers the promise of lower document costs, less space allocated to files, and reduced staff time. Indeed, my effort to make CT DEEP “paperless” was met with great enthusiasm – particularly my further proposal that the basement file space would be converted to a coffee bar.

More generally, public participation processes should be reconfigured for the 21<sup>st</sup> Century. Where 60 or 90 days of review might have been needed in the past for interested parties to file comments by mail, today’s instant communications options means that 30 days of time should be the norm for notice and comment procedures with extended time granted only for particularly complicated issues. Some consumer groups and environmental organizations may claim that compressed review timeframes limit regulatory oversight. But their objections cannot be squared with the fact that “time is money” and the reality that many past processes moved far too slowly, adding cost and regulatory burden that cannot be justified, especially as companies face growing global competition from enterprises operating abroad under much lighter regulatory requirements.

To put a finer point on this competitiveness concern, the regulatory burden on business has been of little interest to many NGOs who fashion themselves as watchdogs for the public interest. This insensitivity to regulatory efficiency and costs has translated into competitive disadvantage for the United States in many markets and helped to fuel the present political backlash against regulations broadly. The environmental community must fundamentally commit to an agenda of helping to reform and “lighten” the regulatory burden without lowering standards as a way to ensuring ongoing public and political support for environmental protection and other regulatory goals. Simply put, it is much easier to sustain a commitment to robust regulation under conditions of economic vitality and job growth than in circumstances of recession and employment insecurity.

Some innovation efforts must be led from the top. But many innovation opportunities will be missed if there is not a parallel commitment to bottom-up efforts to find breakthroughs. Regulatory excellence thus requires that the Agency leadership team encourage fresh thinking and risk taking at all levels so as to ensure that new approaches will be put forward, experimentation undertaken, and better ways of doing business

identified. Given the prevailing “CYA” attitude of most government workers (who have decades of NOT being rewarded for creativity), innovation will not come easily.<sup>29</sup> It must be reinforced constantly with breakthroughs publicly celebrated.<sup>30</sup>

At CT DEEP, I pushed the management team to challenge the prevailing wisdom every day – and to take risks. I urged the middle managers in particular to offer up their ideas on how things might be done differently – and promised to run interference for them with their bosses or the EPA supervisors beyond the Agency. From this commitment to honor innovation came dozens of new initiatives including, for example, a restructured approach to removing asbestos from schools – *without* a threat of penalties for Clean Air Act violations and *with* a funding mechanism to support energy efficiency improvements for the schools. This emphasis on compliance rather than “gotcha” enforcement along with cost savings for schools through lower energy bills made principals and superintendents (and thus local officials as well as state representatives and state senators) big fans of the transformed approach to asbestos abatement

### *Incentives*

At the heart of regulatory excellence lies a need for careful attention to incentives<sup>31</sup> – the signals that change behavior in the regulated community but also the structure of rewards and penalties that face those in government.<sup>32</sup> The evidence is mounting that when a business sees its profit logic and the government’s regulatory agenda in alignment much more gets done than when these interests are pulling in opposite directions.<sup>33</sup> In the environmental arena, for example, the “command and control” approach to regulation is giving way to market-based regulatory strategies. But the change is happening more slowly than it should. Government leaders need to make incentive analysis a top priority so that their staffs understand how the regulatory framework shapes behavior in the marketplace – with as special focus on unintended consequences.<sup>34</sup> Harnessing economic incentives and competitiveness pressures offers the prospect for improved regulation in many circumstances.

Failure to think about the real-world impacts of regulatory requirements has caused enormous problems. For example, the Superfund program, launched in 1980 with a hope that it would induce greater care in the disposal of hazardous waste, has trapped thousands of properties in regulatory limbo and meant that redevelopment of “brownfields” has become very difficult.<sup>35</sup>

President Obama’s Executive Order 13,563 directs federal agencies to review their existing rules and regulations to determine if they “should be modified, streamlined, expanded, or repealed” so as to make the regulatory framework more effective and less burdensome. This valuable effort to institutionalize a commitment to understanding the real-world impacts of past regulatory efforts and to ensure systematic attention to reform where change should be applied broadly. Every regulatory body should commit to the same sort of systematic review of the efficiency and effectiveness of its existing framework of rules and requirements.

## *Investment*

Where the money will come from to fulfill public policy goals now requires much greater focus than it might have in the past when governments at all levels had bigger budgets. Increasingly, to get brownfields cleaned up, clean energy projects built, or any number of other public investments undertaken, the regulatory structure must be carefully crafted so that limited government resources and incentives can be used to leverage private sector capital.

Much of the regulatory framework of the 20<sup>th</sup> Century ignored the question of where money for investments would come from. In the environmental arena, for example, the regulatory system has long centered on “red lights” – rules that spelled out what polluters were told to STOP doing. Today, it is clear that we need an equally well developed structure of “green lights” that give a GO signal to the business world and engage the entrepreneurial spirit of the private sector in solving problems – whether developing renewable energy technologies or making investments in new infrastructure such as water systems.<sup>36</sup>

In the spirit of inducing private capital into needed clean energy projects, CT DEEP shifted from the prevailing 20<sup>th</sup> Century “subsidy” model for promoting renewable power and energy efficiency to a new approach centered on clean energy “finance.” Rather than trying to pick winners and fund their projects, Connecticut launched a Green Bank with the express mission of using limited public funds to leverage private investment in clean energy projects – with a new focus on “cheaper, cleaner, and more reliable” energy. By “derisking” clean energy investment in Connecticut, incentivizing entrepreneurial activity, and harnessing the discipline of private capital and market forces, CT DEEP was able to deliver a ten-fold increase in renewable power projects in the state and vastly increased support for energy efficiency while lowering project costs.<sup>37</sup>

The new approach demonstrates several additional elements of regulatory excellence. First, rather than seeking new money, existing funds were redeployed. Second, market forces were harnessed to produce better results. The key to the expanded renewable energy portfolio (covering solar, wind, and fuel cells) centered on reverse auctions and marketplace competition across technologies as well as specific projects to drive down costs.<sup>38</sup> Third, the state recognized that creating more certainty in the marketplace was a critical government role as clarity and predictability helps to reassure private investors and reduce their perception of the risk of putting up capital. CT DEEP launched a number of efforts in this regard, notably providing the winners of the reverse auctions with 10- and 15-year Power Purchase Agreements that they could literally “take to the bank” and get low-cost financing as well as other efforts. In addition, the Green Bank helped to standardize clean energy contracts, launched a Property-Assessed Clean Energy (PACE) program that provided for repayment of commercial energy loans on local property taxes, led an initiative with cities and towns to lower the “soft costs” of

oversight and regulation, and took a tranche of default risk from the private banks putting up funds, which reduced their perceived risk and led to a lower cost of capital and a dramatic increase in the flow of private finance for clean energy projects.<sup>39</sup>

### *Implementation*

As noted earlier, regulatory excellence must be judged not by good intentions or money spent but rather by on-the-ground results achieved. Efficacy matters. And so does efficiency. It turns out to be important to remind all those working on regulatory matters that getting good outcomes (which protect the public) should be a priority, but so should speed.<sup>40</sup> And clarity about what should be done is also important. In fact, getting an answer of “no” from a regulatory agency quickly is often better (as it allows a filing to be redone in a manner that will work) than a drawn-out review.

In delivering regulatory programs, moreover, the public must believe that the standards being imposed make sense and that enforcement of the rules is being done in a predictable, efficient, and neutral manner. All of this requires a focus on transparency – and metrics that make vivid the requirements, standards, and expectations.

We now live in a world that is data-driven and fact based. Directionally correct environmental regulation is not good enough. Regulatory mandates must be narrowly tailored to statutory goals and implemented in a cost-effective manner. Demonstrating these elements of regulatory excellence requires carefully designed metrics.<sup>41</sup> In the past, too many performance measurement systems tracked activity or inputs rather than results. EPA, when I was there in the 1990s, tracked “enforcement” progress by counting the number of cases brought – which led to a spike at the end of each quarter in asbestos violations notices going out, representing the easiest sort of case to bring but not necessarily the most high risk behavior to redirect.<sup>42</sup>

Good metrics must be aligned with the regulatory agency’s vision and goals – and designed to focus attention on the most critical priorities.<sup>43</sup> As noted earlier, care must be taken in the performance measurement design otherwise incentives will be created to “teach to the test,” which torques effort away from strategic goals that require sustained effort to those with short-term payoffs. In addition to proper framing, any system of performance measurement must be undergirded by statistical best practices. For example, metrics need to be normalized to ensure that unlike circumstances are not being compared. And sensitivity analysis should be deployed to highlight what assumptions or factors determine outcomes.

Good implementation requires more than robust metrics. Regulators must be committed to a program of continuous improvement in their work. In this regard, it is critical that everyone in the Agency be focused on productivity gains. Performance needs to be benchmarked both internally and externally – and lagging performers need to be coached on how to improve. Best practices need to be systematically identified both from within the Agency and from others doing similar work in other agencies.

## Conclusion

Bringing a degree of analytic rigor to the quest for regulatory excellence offers the promise of much better results in a variety of settings. A body of theory about what is required for improved performance has begun to emerge. Now the practice needs to follow with a further commitment to developing metrics to track improvements and to creating an empirical foundation for additional refinements to the theory.

## Notes

<sup>1</sup> There has been, of course, some important scholarly work on regulatory reform including contributions from James Q. Wilson, Stephen Bryer, Jerry Mashaw, Peter Schuck, and Cary Coglianese among others.

<sup>2</sup> John Kotter, "Leading Change: Why Transformation Efforts Fail," *Harvard Business Review*, (January 2007), pp. 4-5.

<sup>3</sup> Leonard Berry and A. Parasuraman, "Listening to the Customer: The Concept of a Service-Quality Information System," *MIT Sloan Management Review*, vol. 38 (Spring 1997), p. 73.

<sup>4</sup> Quoted in Aamer Baig and others, "How US State Governments Can Improve Customer Service," *McKinsey & Company*, December 2014, pp. 2-4.

<sup>5</sup> Pascal Dennis, *The Remedy: Bringing Lean Thinking out of the Factory to Transform the Entire Organization* (Hoboken: John Wiley & Sons, 2010).

<sup>6</sup> Eric Scorsone, "New Development: What Are the Challenges in Transferring Lean Thinking to Government," *Public Money & Management*, vol. 28 (March 2010), pp. 61-64.

<sup>7</sup> Connecticut's Environmental Quality Scorecard (CT DEEP, 2014)(available through CT DEEP Public Affairs Office). Resignation letter of Commissioner Daniel C. Esty to Governor Dannel P. Malloy (January 15, 2014)(available through CT DEEP Public Affairs Office).

<sup>8</sup> Cary Coglianese and Jennifer Nash, *Leveraging the Private Sector: Management-Based Strategies for Improving Environmental Performance* (Washington: Resources for the Future, 2006).

<sup>9</sup> See OECD Best Practice Principles for Regulatory Policy, "Regulatory Enforcement and Inspections," 2014 ([www.oecd.org/gov/regulatory-policy/enforcement-inspections.htm](http://www.oecd.org/gov/regulatory-policy/enforcement-inspections.htm)).

<sup>10</sup> Elizabeth Chambers and others, "The War for Talent," *The McKinsey Quarterly*, (2007), p. 2.

<sup>11</sup> Particular care must be taken to ensure that the incentives created do not lead to unintended consequences. At the EPA in the 1990s, I saw how "bean counting" in the enforcement arena led to a focus on minor problems (such as asbestos removal non-compliance), which could be easily undertaken and "score" an enforcement point rather than major issues (airsheds failing to meet ozone standards) which required 1000 times more effort to work into an enforcement action.

<sup>12</sup> Daniel C. Esty, "Why Measurement Matters," *Environmental Performance Measurement: The Global 2002*, (2001).

<sup>13</sup> Peter Schuck, *Why Governments Fail So Often And How It Can Do Better* (Princeton: Princeton University Press, 2014), p. 92.

<sup>14</sup> Stephen G. Breyer, *Administrative Law and Regulatory Policy: Problems, Text, and Cases* (New York: Wolters Kluwer Law & Business, 2011).

Jerry L. Mashaw, *Greed, Chaos, and Governance Using Public Choice to Improve Public Law* (New Haven: Yale University Press, 1997).

Eric Posner and Cass Sunstein, "Institutional Flip-Flops," Working Paper 501 (Chicago, Illinois: University of Chicago, 2015).

<sup>15</sup> Daniel Esty, "Good Governance at the Supranational Scale: Globalizing Administrative Law," *Yale Law Journal*, vol. 115 (2006).

<sup>16</sup> John Graham and Jonathan Wiener, *Risk vs. Risk Tradeoffs in Protecting Health and the Environment* (Cambridge: Harvard University Press, 1997). Stephen G. Breyer, *Breaking the Vicious Circle: Toward Effective Risk Regulation* (Cambridge: Harvard University Press, 1993).

<sup>17</sup> John D. Graham, *Bush on the Home Front: Domestic Policy Triumphs and Setbacks* (Bloomington: University of Indiana Press, 2010), pp. 149-150.

<sup>18</sup> Christopher Carrigan and Cary Coglianese, "Oversight in Hindsight," in *Regulatory Breakdown: The Crisis of Confidence in U.S. Regulation*, edited by Cary Coglianese (Philadelphia: University of Pennsylvania Press, 2012), pp. 12-17.

Daniel Farber, "Uncertainty," *Georgetown Law Journal*, vol. 99 (2010-2011), pp. 901-960.

<sup>19</sup> Howard Kunreuther and others, "Fast and Slow Thinking in the Face of Catastrophic Risk," Working Paper 2014-6 (Philadelphia: Risk Management and Decision Processes Center, Wharton School, August 2014).

Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011).

<sup>20</sup> Nick Malyshev, "A Primer on Regulatory Budgets," *OECD Journal on Budgeting*, vol. 2010/3 (2010), pp. 1-10.

Philip Wallach, "An Opportune Moment for Regulatory Reform," *Center for Effective Public Management at Brookings*, (April 2014).

<sup>21</sup> Connecticut Department of Energy & Environmental Protection Regulatory Report, (Hartford: 2014).

<sup>22</sup> Mariana Mazzucato, *The Entrepreneurial State: Debunking Public v. Private Sector Myths* (New York: Anthem Press, 2013).

- <sup>23</sup> Michael Lewis, *Moneyball: The Art of Winning an Unfair Game* (New York: W.W. Norton, 2003).
- <sup>24</sup> Daniel Esty, "Environmental Protection in the Information Age." *New York University Law Review*, vol. 79 (April 2004), pp. 115-211. See also: Center for American Progress, Daniel Esty and Reece Rushing, "Governing by the Numbers: The Promise of Data-Driven Policymaking in the Information Age," 2007 ([https://cdn.americanprogress.org/wp-content/uploads/issues/2007/04/pdf/data\\_driven\\_policy\\_report.pdf](https://cdn.americanprogress.org/wp-content/uploads/issues/2007/04/pdf/data_driven_policy_report.pdf)).
- <sup>25</sup> Streamlining the UST Inspection Process through Technology & the LEAN Process, New England Annual Meeting for Enforcement, Compliance & Assistance, Lori Saliby, Supervising Environmental Analyst, June 4, 2014.
- <sup>26</sup> "Outcomes from Permitting Process Meetings," DEEP Deputy Commissioner Macky McCleary (February 15, 2012).
- <sup>27</sup> See The White House, "Office of E-Government & Information Technology," ([www.whitehouse.gov/omb/e-gov/](http://www.whitehouse.gov/omb/e-gov/)).
- <sup>28</sup> Richard Thaler and others, "Choice Architecture," in *The Behavioral Foundations of Public Policy*, edited by Eldar Shafir (Princeton: Princeton University Press, 2010).
- <sup>29</sup> "Four Ways Companies Can Encourage Innovation," *Capital Ideas: Chicago Booth School of Business*, (September 2014), p. 1.
- <sup>30</sup> Brad Power, "How Toyota Pulls Improvements from the Front Line," *Harvard Business Review*, (June 2011), p. 2.
- <sup>31</sup> Madhu Khanna and William Anton, "Corporate Environmental Management: Regulatory and Market-Based Incentives," *Land Economics*, vol. 78 (November 2002), pp. 539-58.
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