



# A Safe-and-Sane Process for Smart Grid Implementations:

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Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/ Distribution/ generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "[Smart Grid Redefined: Transformation of the Electric Utility](#)" and "[Electric System Operations – Evolving to the Modern Grid, 2nd Edition](#)", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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**Utilities prefer tried-and-tested solutions. Most smart grid technologies do not yet have lengthy track records. As a result, utilities face a dilemma. If they want smart grid benefits, they must adopt (relatively) unproven technologies. If they wait until those technologies are fully proven, they and their ratepayers will miss out on the benefits.**

**Fortunately, a simple process can institutionalize a safe and sane approach to smart grid implementations.**

## How we got here:

As regulated entities, utilities need permission from their commissioners for major capital investments. Any investments that do not deliver on promised results often get treated as 'mistakes' -- and mistakes are not taken lightly by regulators or ratepayers.

The traditional, take-no-chances approach was fine in the pre-smart grid era. Key technologies have been around for decades. "Change" often meant nothing more than a slightly different transformer design or a new algorithm for the EMS. Though large decisions still had risks, they were nothing compared to what the smart grid brings. But that's not the world we live in now.

## So what has changed?

*Under the banner of smart grid, three major changes have happened:*

- New sensing and control technologies (supported by new mechanisms for communications)
- New disruptive technologies like storage and distributed generation (supported by new materials)
- A utility propensity to pilot without follow-through - a condition many call "Pilotitis"

*Many of the technologies are new and unproven. Or, if the technology is proven, then the benefits are unproven. So, what should a utility do? Ignore everything until it is all proven? Yet if all utilities take this approach, then the technology (and its benefits) will never be known or realized.*

## The safe-and-sane alternative:

*We recommend that utilities take their current business-as-usual approach and add a slight twist. This article proposes a five-stage, high-level approach:*

- Monitor
  - Identify key individuals to monitor specific technologies for applicability to specific problems. Between conferences, Web sites, and industry reports, there is a wealth of information available to all.
- Evaluate from the larger list of monitored technologies, and select a smaller set for evaluation in a lab-like environment. Test the technology to verify that it works and has the potential to deliver benefits.

# A safe-and-sane process for Smart Grid Implementations:



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- Test Pilot
  - Continue the down-selecting process to a select few that are ready to be piloted in the field. When setting up the pilot, ensure that the expected outcomes are documented and next steps identified. At this stage, you need to inform your regulators and keep them closely in the loop.
- Obtain Regulatory Approval
  - When the benefits from the pilot are known, the technology is now ready for regulatory approval for full-scale deployment. The data for the business case should be available from the earlier steps,.
- Deploy in Stages
  - Many implementations take several years to complete and key aspects, communications, sensor materials, standards, interface protocols, and so on may change as they go along. Because of these ongoing changes, it is important to deploy in stages. This allows the utility to hedge its exposure and avoid locking itself into one technology.

*\*(Editor's note: Smart Grid News concurs with this approach, with the added suggestion that utilities should consider shared-cost pilots to save time and money.)*

*Now, this is not completely new to utilities. In fact, the twist comes from (1) The process should be ongoing (2) Pilots when started should lead to full implementations unless the technology or implementation did not pan out (3) Bringing the regulator into this equation early in the process and (4) NEVER go for the full implementation in one shot. Implement in stages because even when the technology is proven out, parts of it will still change over time.*

*Key point: This should not be a one-time deal but an ongoing process for all aspects of the smart grid until it becomes Business as Usual. This must be a structured process that is repeated periodically to ensure follow-through where it appears that there may be tangible benefits for the utility. Failure to follow this (or a similar) process can lead to lots of pilots without lessons learned leading to an extension to the rest of the utility or to other utilities. The proposed "safe-and-sane" approach will lead to an orderly analysis of the merits of different technologies and build on itself to deliver a continuous stream of benefits to utilities over time.*