

# Pay for Performance Regulation: Market Monitor's Perspective

RPSTF

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# What is the problem?

- **Regulation results in PJM performance which is evaluated against BAAL (and CPS).**
- **Current regulation results in PJM meeting both standards.**
- **Therefore there is no current performance problem.**
- **There is no clear statement of an expected problem in PJM.**



# What is the demand?

- **Purpose of regulation is to meet the BAAL standard (dampen ACE and maintain interconnection frequency).**
- **PJM's RegA signal was developed to direct regulation resources to satisfy a defined goal.**
- **RegA signal is not a single standard, but is a function of the available resources and the goal.**
- **Regulation resource goal is to follow the RegA signal.**



# What is the demand?

- **Based upon expected response profile of the current fleet of regulating units, PJM defines an hourly requirement for regulation.**
  - Requirement is “MW available within 5 minutes”.
  - Requirement is both up and down from a resource set point; or simply MW.
- **Existing regulation is tested to ensure performance based on the existing definition.**



# Cost of regulation

- **Could the demand for regulation be met at lower cost?**
- **If “MW available within 5 minutes both up and down from the set point” were changed could regulation be provided at lower cost?**
- **For example, if the 5 minute limit were changed to 1 minute (or less) could the BAAL standard be met at lower cost?**

# Definition of the product

- **The regulation product has multiple possible definitions.**
- **Few studies of the costs and benefits of alternative definitions.**
  - **None with definitive answers.**
- **One issue is the unit of measurement.**
  - **Traditional regulation is MW (available within 5 minutes).**
  - **Rapid response units provide RegA correspondence (ACE offset).**
- **Relationship between two units of measurement is undefined.**



# Definition of the product

- **Rapid response regulation will have greater RegA correspondence per MW of regulation capacity over the range it can respond.**
- **Inconsistency between current definition of product in MW and product defined as RegA correspondence.**



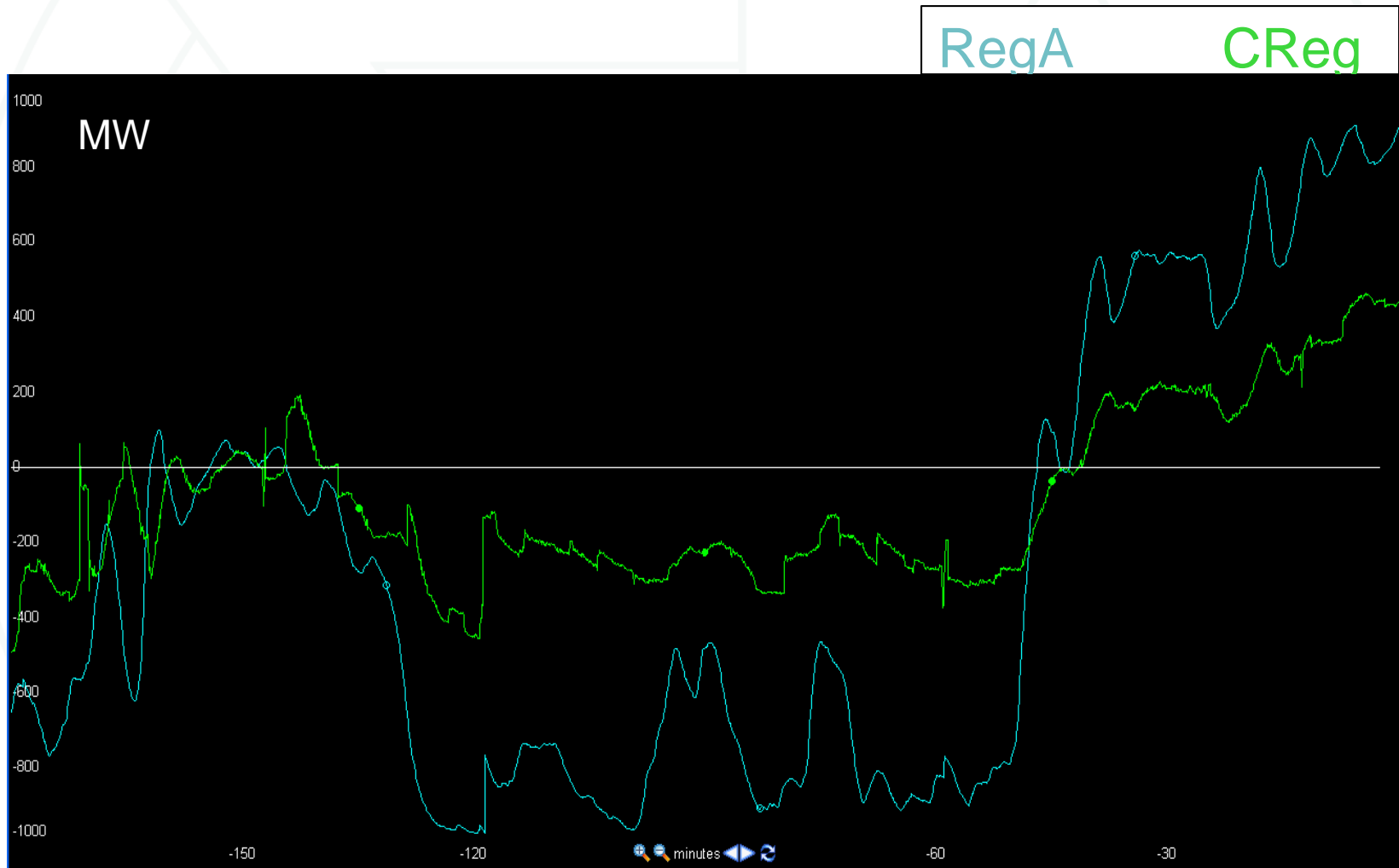
# How do products meet demand?

- **MW available in 5 minutes is measurable and testable.**
- **MW of RegA compliance is difficult to define. It depends on the nature of the RegA signal.**
- **Fast response units can track some RegA signal patterns and not other RegA signal patterns.**
- **When RegA is negative or positive for a long period of time, fast response units (which are not generators) may exhaust their capacity.**
- **When RegA has many small displacements and crosses zero often, fast response units will more closely track RegA than traditional units.**

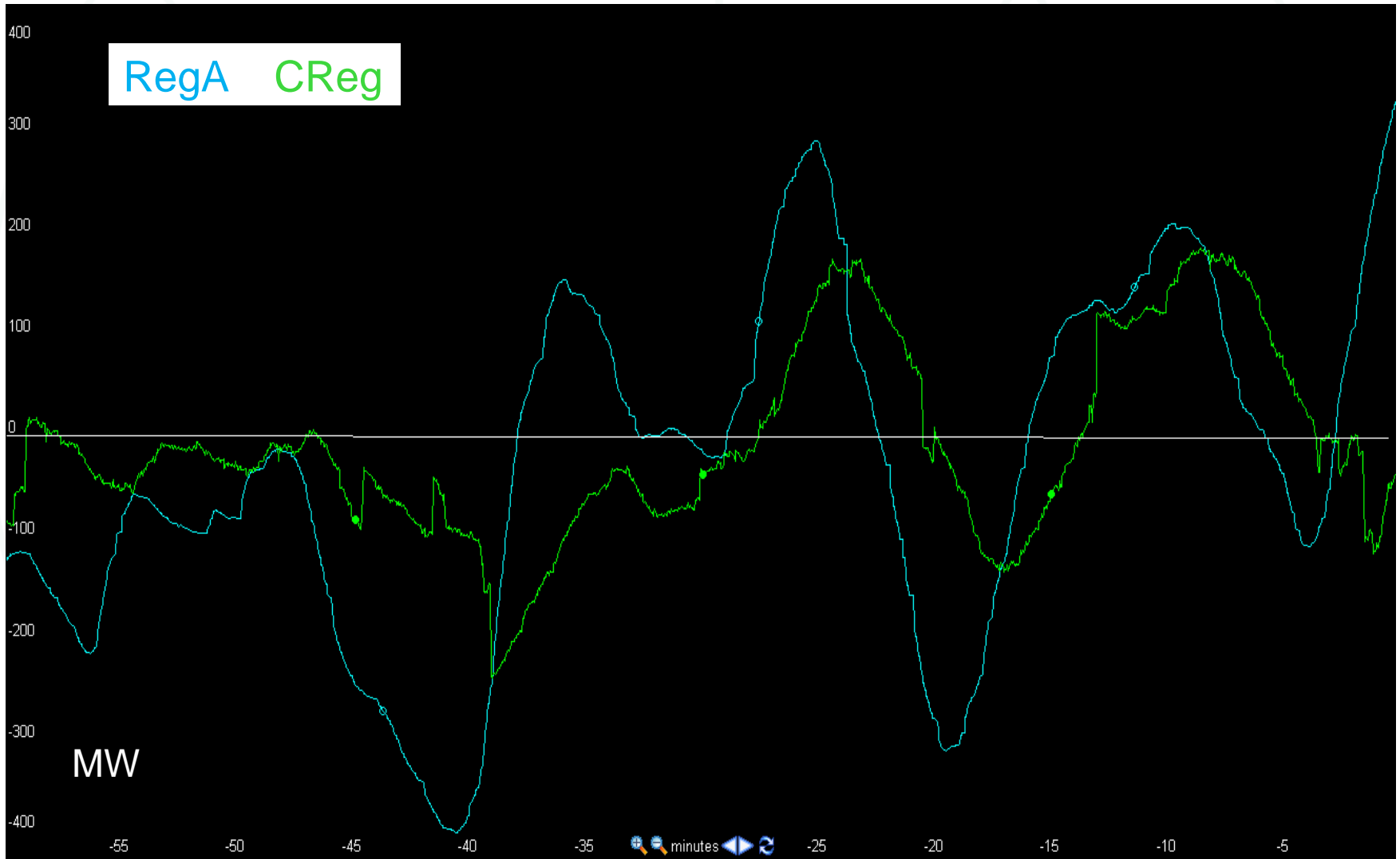




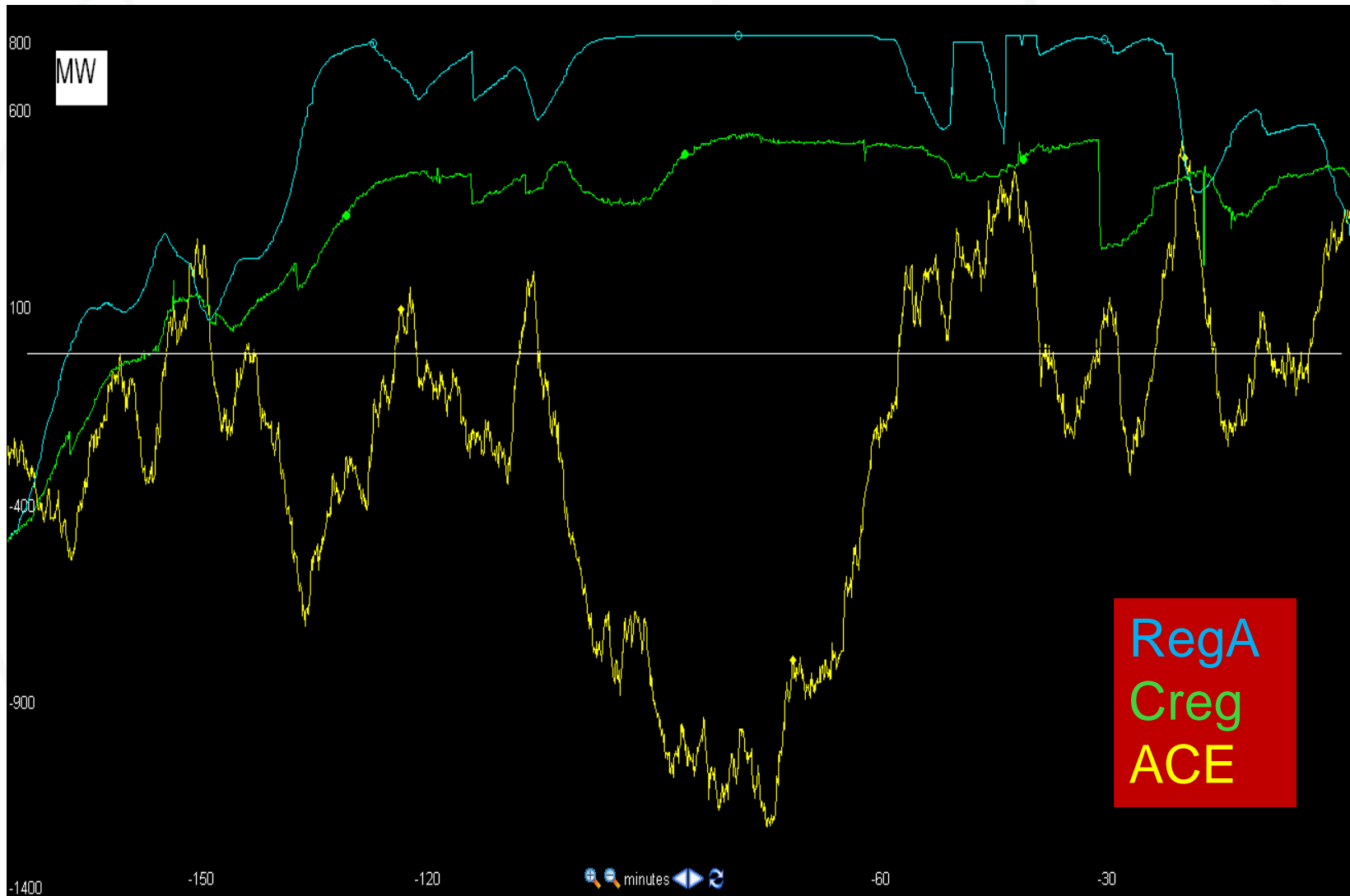
# Example 1. Fast Regulators Cannot Track RegA



# Example 2. Fast Regulators Can Track RegA



# Example 3. MW of Regulation Needed



# Some Solutions Proposed by Others

- **No change to existing Regulation Market and operation.**
- **No change to existing Regulation Market and operation plus pay “performance incentive” to rapid response regulation.**
- **Change definition of regulation product.**
- **Create a second RegA signal for rapid response regulation.**



# Market Design

- **A logical market design for regulation must include:**
  - **A definition of the single product**
  - **A definition of the units used to measure the product**
  - **A definition of the demand for the product**
- **These elements exist for the current regulation market design**
  - **The current regulation market design can accommodate fast response technologies**
  - **Prices in the regulation market will increase under current proposals for scarcity pricing**



# Market Design

- **If fast response regulation is a different product, then there should be a separate market for that product.**
- **That market design must include:**
  - **A definition of the single fast response regulation product**
  - **A definition of the units used to measure the fast response product**
  - **A definition of the demand for the product**
- **These elements do not yet exist for the fast response regulation market design**
  - **There is no defined demand for the fast response regulation product**



# Market Design

- **Paying an incentive premium is not an adequate approach to the market design issue.**
- **The same questions need to be addressed for a market premium:**
  - **A definition of the single fast response regulation product**
  - **A definition of the units used to measure the fast response product**
  - **A definition of the demand for the product**
- **These elements do not yet exist for the fast response regulation market premium**
  - **There is no defined demand for the fast response regulation product**



# Market Design

- **The costs and benefits of paying an incentive premium require careful evaluation of a specific proposed market design.**
- **No such analysis has been performed.**
- **Market power metrics require a consistent and well defined market design.**





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