

DE LA RECHERCHE À L'INDUSTRIE



# IRENA TECHNOLOGY ROADMAP ON ELECTRICITY STORAGE FOR RENEWABLES

## 5.1. INNOVATIVE REGULATION AND INCENTIVES

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### Objectives of the action item

- Engage regulators to develop innovative regulations supporting electricity storage of renewables:
  - ✓ Integration of revenues from multiple storage services
  - ✓ Specification of technical requirements for better deployment of VRE
  - ✓ Identification of new type of actors
  - ✓ Creation of new economic activities to support growth
- Engage grid operators to indicate requirements
- Engage RE generators to share possibilities and concerns

### Possible obstacles

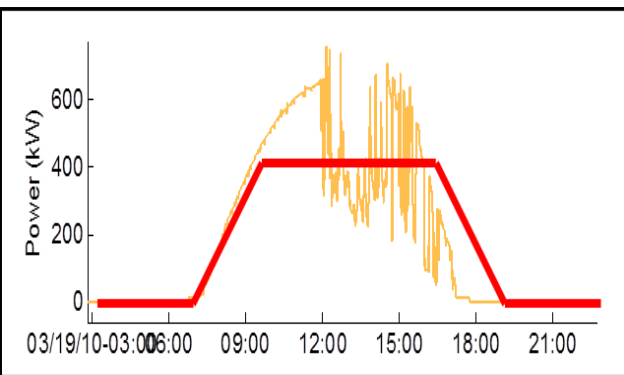
- Convergence of concertation of multiple actors
- Multiple options of technical specifications
- Necessary time for assessment impact of new regulation
- Necessary budget

### Solutions

- International coordination and sharing of experiences
- Focus on territories with high cost of power generation
  - ✓ Islands and remote areas
- Focus on storage services with high ROI
  - ✓ Frequency regulation

## More and more examples to share

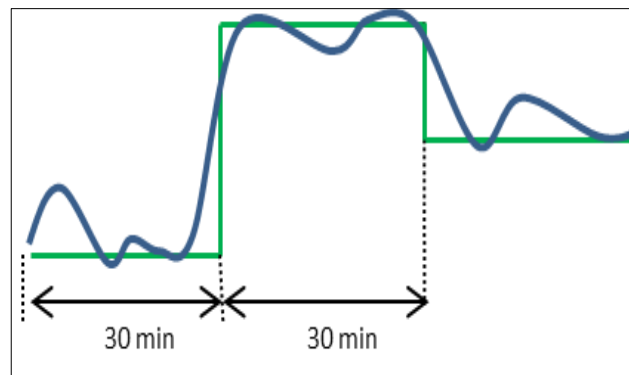
- French windpower+storage feed-in tariff for islands: 1MWh/MWp Li
- PV-storage 2012 RFP for French islands: 1MWh/MWp Li
- Puerto Rico EPA RFP: ½ MWh/MWp Li
- Germany, California, Hawaii, ...



French islands 2012 RFP

Trapezoidal production pattern with forecast

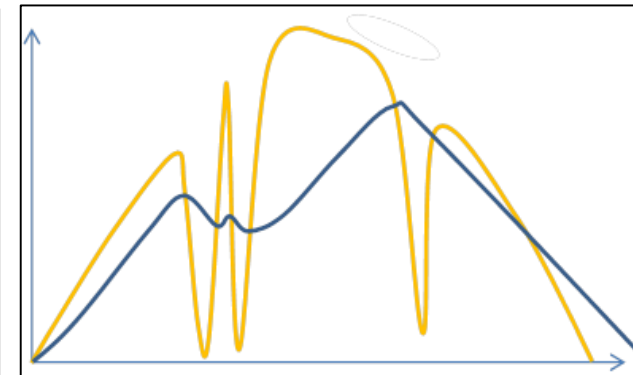
+ f/U primary regulation



French islands windpower tariff

Production forecast and limited variation of real production

+ f/U primary regulation



PREPA RFP

Puerto Rico

production smoothing

+ f/U primary regulation

## Some of the common technical requirements

- Limitation of VRE power injection
  - ✓ Two benefits: reduced impact on grid infrastructure/voltage and energy time-shifting
- Smoothing:
  - ✓ Two options: ramping and/or limited variation around mean value
- Ancillary services
- Production forecast

