



Emerging Technologies Integration Plan (ETIP) Overview and Summary

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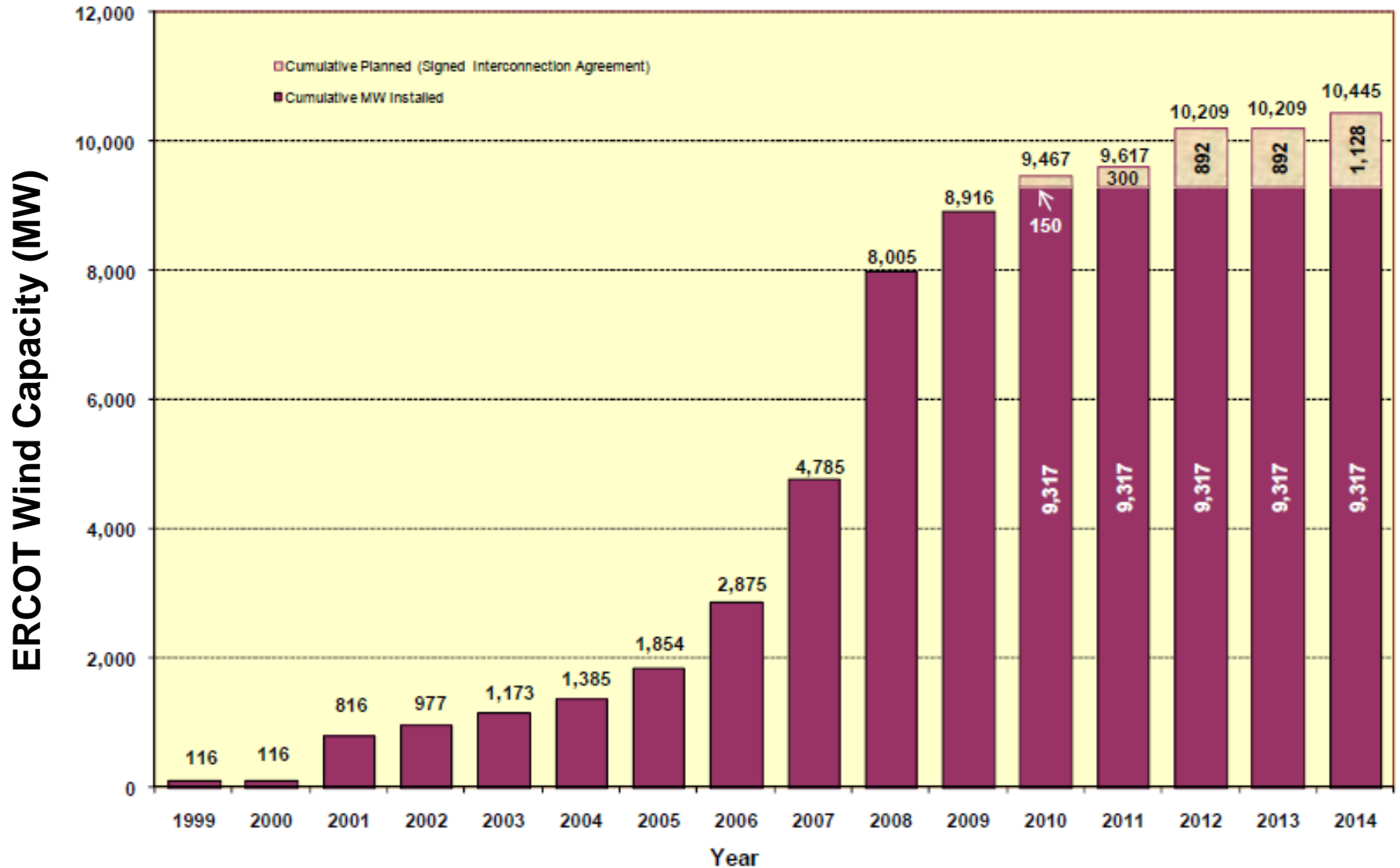
TAC Presentation to ERCOT Board of Directors

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Overview

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Chronology of RTWG and ETIP development



Chronology of RTWG and ETIP development

- **Wind Workshop I**
- **Feb. 26, 2008 EECF Event**
- **Series of wind-related Revision Requests**
- **Board request for holistic vision**
- **PUCT CREZ Order**
- **TAC formation of RTWG**
- **Development of Quarterly Reports to PUCT and Issues List**
- **Transition from “renewable” to “emerging” technologies**

ETIP Purpose

1. Identify issues related to the integration of renewable and emerging technologies which have been recently addressed by ERCOT or the ERCOT stakeholder process, issues which are currently under active consideration in ERCOT and stakeholder processes, and issues which perhaps should be considered in the future.
2. Report the status of identified renewable and emerging technologies integration issues.
3. Provide TAC, the ERCOT Board, and the PUCT with a resource document and high-level plan from which to holistically consider the appropriate policies, activities, and allocation of resources committed to addressing renewable and emerging technologies integration efforts.
4. Suggest goals to guide the emerging technologies integration efforts of ERCOT and stakeholders.
5. Recommend organizational and procedural changes in the ERCOT stakeholder process to improve the management of renewable and emerging technologies issues and the transparency of ERCOT and stakeholder activities related to integration of renewable and emerging technologies.

ETIP Goals

Process

Improve the stakeholder processes for identifying, organizing, deliberating, resolving, and tracking issues of importance regarding the integration of emerging technologies into the ERCOT system.

Awareness

Increase ERCOT and stakeholder awareness of emerging technologies which may impact ERCOT functions or ERCOT market functionality.

Education

Increase ERCOT and stakeholder education on those technical issues related to emerging technologies which are anticipated to have meaningful impact on ERCOT functions or ERCOT market functionality.

Preparedness

Ensure ERCOT is sufficiently prepared to resolve integration challenges associated with emerging technologies.

Communication

Provide timely and effective stakeholder communication to policy makers, decision makers, and stakeholders regarding the issues arising from the integration of emerging technologies and the progress and effectiveness of strategies to resolve such issues.

ETIP Phases

Phase 1

- March 2008 through Summer 2010
- Identify high priority wind integration issues to resolve in Zonal
- Identify high priority wind integration issues to resolve for TNMID

Phase 2

- Late 2010 through 2013
- Follow up and evaluation of relevant Phase 1 activities
- Identify post-TNMID wind integration issues and CREZ implementation issues
- Explore integration issues associated with other emerging technologies

Phase 3

- 2014 through ?
- Follow up and evaluation of relevant Phase 2 activities

- **Organized around Categories of Issues**
 - System Planning
 - System Operations
 - Market Design
 - Workshops and Training
- **Standard considerations for each issue**
 - Policy
 - Reliability
 - Technical
 - Performance Criteria and Compliance Metrics
 - Cost Allocation
 - Texas Nodal Market Implementation
 - ERCOT Resources

Wind Integration Activity Summary

- **Wind Workshops**
 - WW I: Identify critical wind operational issues
 - WW II: Technical conference on wind turbine capabilities
 - WW III: Brainstorming session on future high penetration issues
- **Nodal Preparations**
 - Accelerated use of ERCOT Wind Power Forecast
 - Accelerated WGR met data telemetry requirements
 - Review of wind integration in Nodal Go-Live systems
- **Procedural Solutions**
 - Voltage management practices for WGR operators and TSPs
 - ERCOT Balancing Energy Offset procedures
 - ERCOT Wind Power Forecast distribution to WGR QSEs

WGR / CREZ Revision Requests (March 2008 - October 2010)

		Filed		Withdrawn / Rejected		Endorsed / Approved by TAC		Approved by ERCOT Board					
PRRs	17	763	810	2	828 835	763	810	15	763 771 773 777 778 793 794 800	810	15	763	810
		771	811			771	811			771		811	
		773	812			773	812			773		812	
		777	824			777	824			777		824	
		778	828			778	830			778		830	
		793	830			793	833			793		833	
		794	833			794	841			794		841	
		800	835			800	841			800		841	
NPRRs	7	159	214	0		159	214	7	5	159	214	159	214
		195	239			195	239			195	239		
		210	269			210	269			210	269		
			270				270				270		
OGRRs	6	208	237	0		208	237	6	1	208	237	208	237
		224	238			224	238			224	238		
		226	240			226	240			226	240		
NOGRR	2	043	048	0		043	048	2	N/A	043	048	N/A	N/A
		048				048				048			

Total number of rule changes / technical requirements affecting WGRs implemented through approved Revision Requests in the 30 months since Wind Workshop One: 28

Integration of Non-Wind Emerging Technologies

- **Storage Workshops**
- **Planning for Solar Workshop**
- **Planning for Inter-ISO workshops on storage and solar**
- **Transition of Power Storage Working Group to Emerging Technologies Working Group**
 - ETWG will be placed under the Wholesale Market Subcommittee
 - ETWG will replace RTWG, which will be retired in December

ETIP Recommendations

- 1. Revise and expand the scope of and rename the Renewable Technologies Working Group**
- 2. Place the new Emerging Technologies Working Group under the Wholesale Market Subcommittee**
- 3. Improve the Emerging Technologies issues tracking system**
- 4. Provide ERCOT Staff support for Emerging Technologies Working Group activities**

ETIP Status

- At this point, the ETIP is still considered a work in progress or living document.
- Inclusion or non-inclusion of particular issues and the characterization of those issues should be considered informative but not dispositive. The state of the document today is not intended to be the last word on these topics but rather one way to organize a series of long-running technical and policy discussions into a platform from which further activities can be channeled to efficient and productive ends.
- TAC seeks input from the Board of Directors on the ETIP and further activity related to integration of renewable and other emerging technologies, particularly related to the four ETIP Recommendations and the dedication of ERCOT resources to stakeholder integration activities through the Emerging Technologies Working Group under the Wholesale Market Subcommittee.

TAC Recommendation

- **On Nov. 4, TAC endorsed all 4 recommendations of the ETIP.**
- **TAC has already begun implementation of Recommendations Nos. 1 and 2.**
- **TAC did not specifically endorse the inclusion or exclusion of any particular issue in the ETIP nor the specific characterization of any issue within the ETIP.**
- **TAC requests the Board consider the ETIP, the issues discussed therein, and provide guidance to TAC's ongoing efforts to address emerging technologies integration challenges.**
- **Recommendations Nos. 3 and 4 in particular will require direction from the Board and/or ERCOT management.**