

CREYAP II Data Pack - Revisions

July 2013



CREYAP Exercise - Part II

A data pack was supplied by RES Ltd. for the Comparative Resource and Energy Yield Assessment Procedures (CREYAP) Exercise Part II as part of the [EWEA Technology Workshop: Resource Assessment 2013](#)

The data pack included a wide range of information necessary for performing a wind speed and energy yield prediction for a 22-turbine wind farm

Information supplied for CREYAP II:

- Site-measured data from 7 site assessment masts
- Reference data (MERRA and ground-based)
- Roughness & obstacle information
- Turbine & layout information
- Terrain data

60 participating teams from 56 global organisations submitted results

Results were presented by Niels G Mortensen and Hans E Jørgensen of DTU Wind Energy

See [www. EWEA.org](http://www.EWEA.org) for more details

CREYAP II Data Pack - Revisions: Feedback

Data Pack Feedback

Following the closing date for submissions (May 2013), comments were fed back from 3TIER and Deutsche WindGuard Consulting regarding the MERRA data supplied within the pack



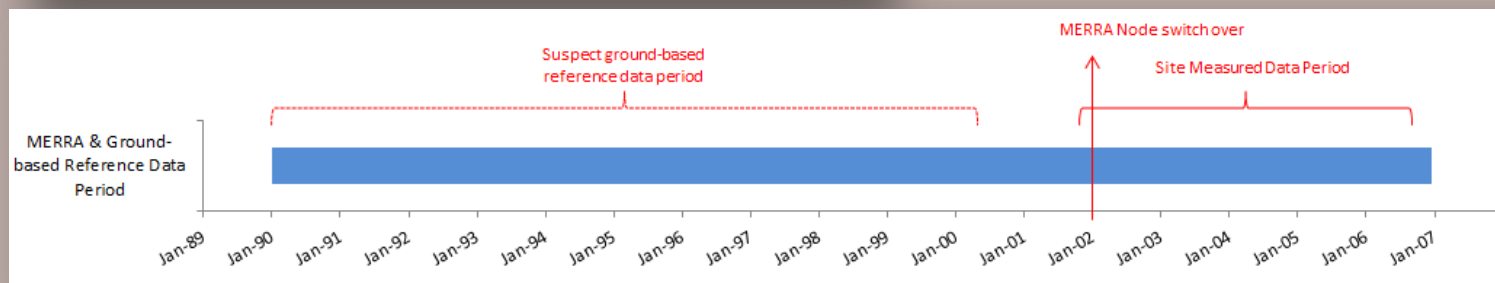
Feedback Comments:

- CREYAP II MERRA data record consisted of data merged from two adjacent nodes (see map)

Note: The node intended for CREYAP II was 56.00N -2.67E

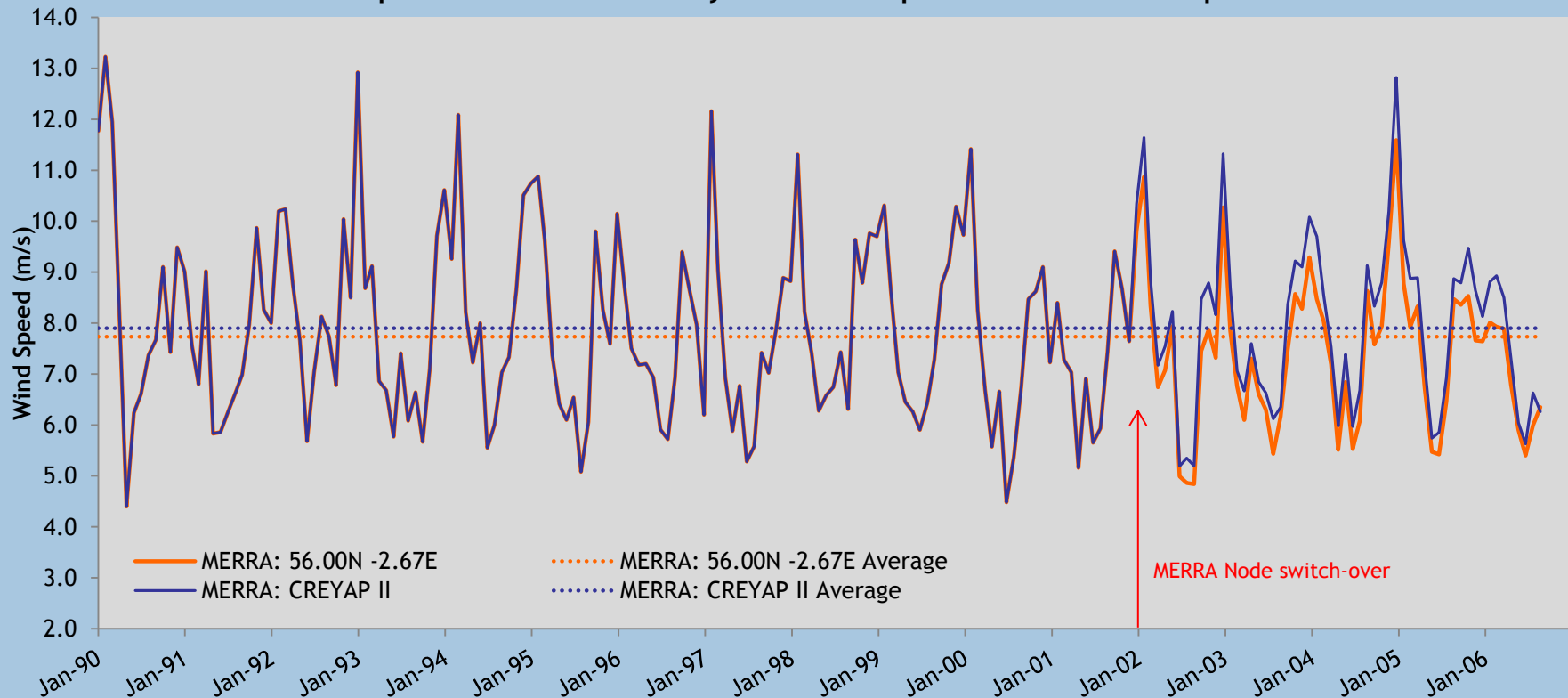
Results from RES Investigation:

- Human error was responsible for the discrepancy in the MERRA data from January 2002 onwards
- The ground-based reference data may have a small discontinuity circa 2000



CREYAP II Data Pack - Revisions: Data Checks

Comparison of MERRA Monthly Mean Wind Speeds - Jan 1990 to Sep 2006



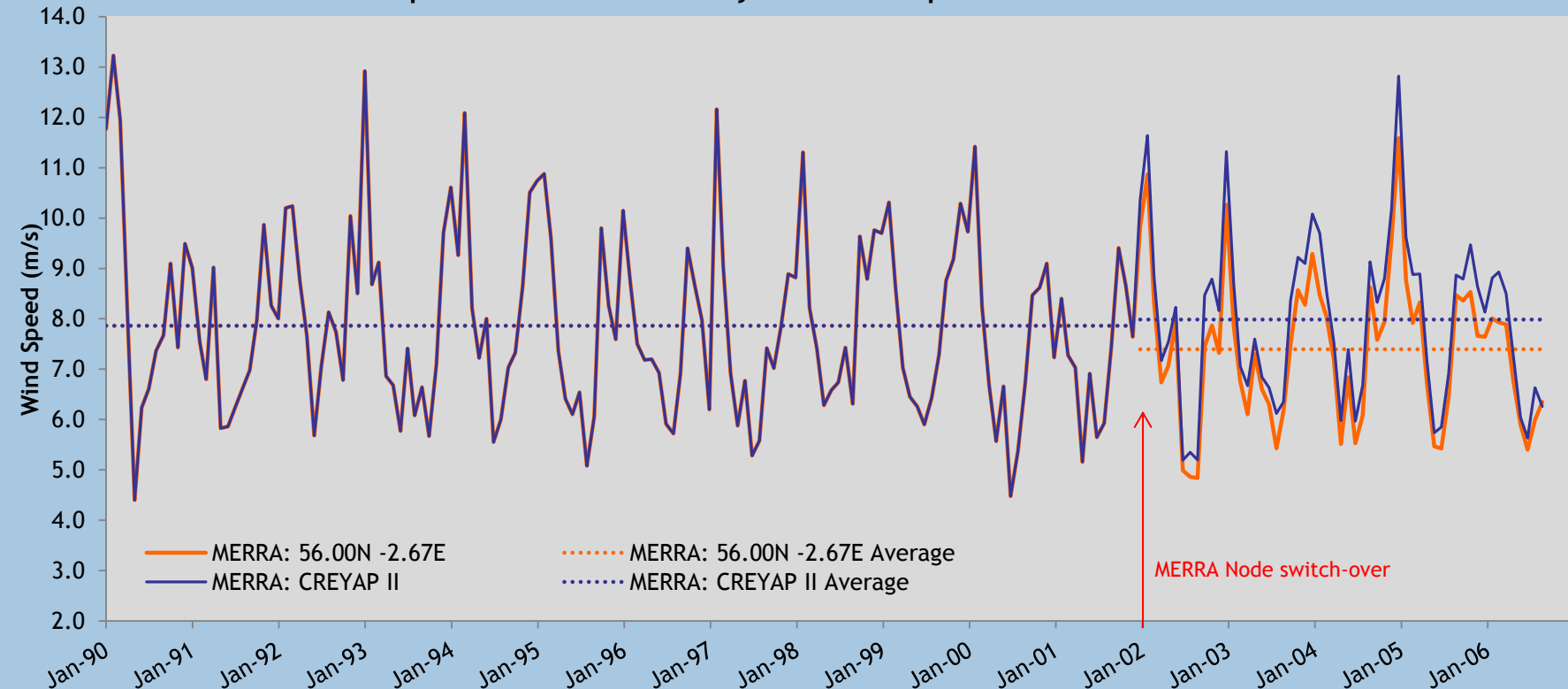
Comparison of MERRA data

- The absolute difference in mean wind speed between MERRA: CREYAP II and MERRA: 56.00N -2.67E is 0.17 m/s
- Note: **MERRA: CREYAP II** is the erroneous dataset supplied in the CREYAP II data pack, whilst **MERRA: 56.00N -2.67E** was the dataset intended for the data pack

Jan 1990 - Sep 2006 (m/s)	
MERRA: 56.00N -2.67E	7.73
MERRA: CREYAP II	7.90

CREYAP II Data Pack - Revisions: Data Checks

Comparison of MERRA Monthly Mean Wind Speeds - Pre/Post Jan 2002



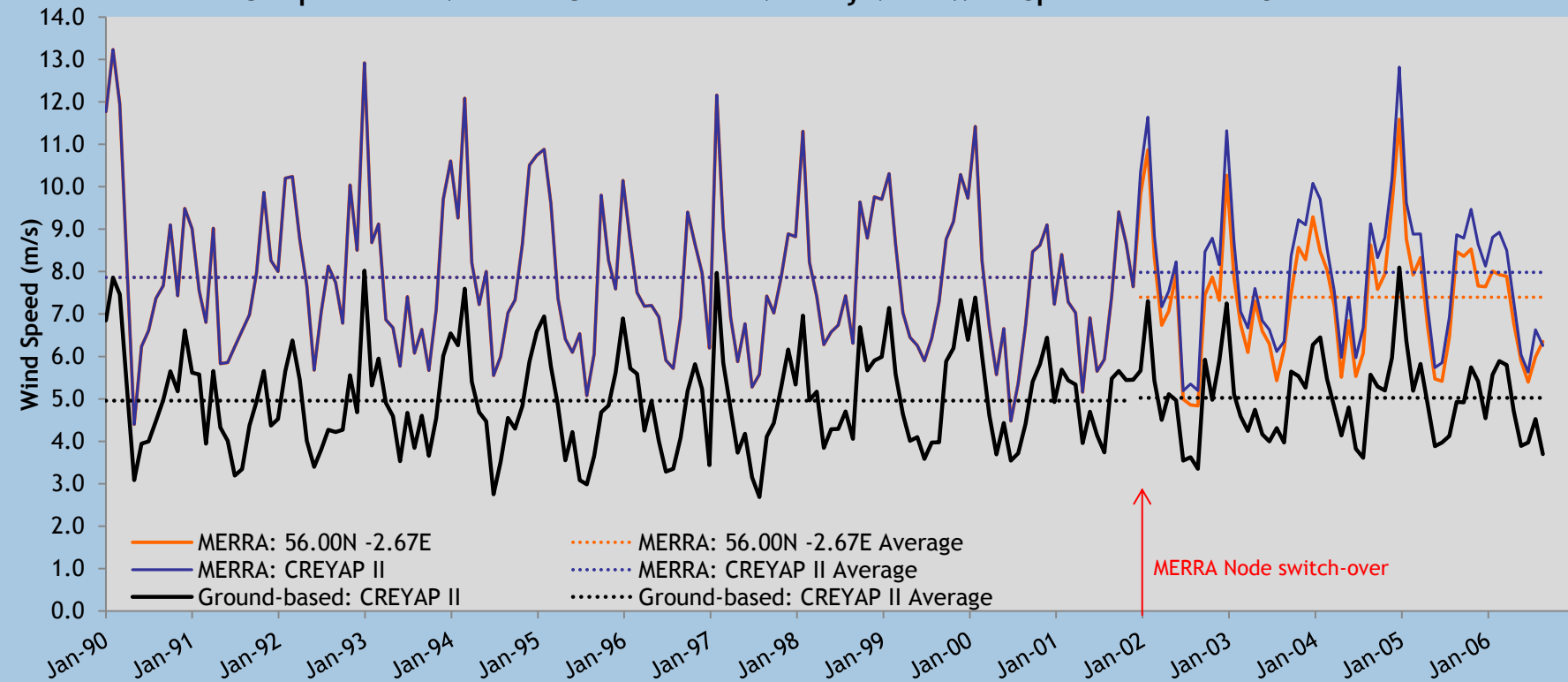
Average wind speeds before & after Jan 2002

- MERRA: 56.00N -2.67E data decrease by 0.47 m/s
- MERRA: CREYAP II data increase by 0.12 m/s

	Jan 1990 - Dec 2001 (m/s)	Jan 2002 - Sep 2006 (m/s)	Change in Mean WS (m/s)
MERRA: 56.00N -2.67E	7.86	7.40	-0.47
MERRA: CREYAP II	7.86	7.98	0.12
Difference in Mean WS	0.00	0.59	-

CREYAP II Data Pack - Revisions: Data Checks

Comparison of MERRA & Ground-based Monthly Mean Wind Speeds - Pre/Post Jan 2002



Average wind speeds before & after Jan 2002

- Ground-based: CREYAP II reference site data increase by 0.07 m/s (1.4 %)
- This is in good agreement with MERRA: CREYAP II

	Jan 1990 - Dec 2001 (m/s)	Jan 2002 - Sep 2006 (m/s)	% Change in Mean Wind Speed
MERRA: 56.00N -2.67E	7.86	7.40	-5.9 %
MERRA: CREYAP II	7.86	7.98	1.5 %
Ground-based: CREYAP II	4.96	5.03	1.4 %

Summary

- The ground-based reference data and MERRA: CREYAP II data are in good agreement - however:
 - A system change at the ground-based reference station in the late 1990s produced a change in the data record that, by coincidence, obscures the error in the MERRA data
 - This results in both sources of reference data producing very similar long-term mean wind speeds
 - There are insufficient reliable ground-based reference data to verify MERRA at this location prior to 2001
 - The MERRA: CREYAP II data are likely to have caused an under-prediction in the long-term estimate when using MCP
 - The production data windiness correction was not affected by the error

CREYAP II Data Pack - Revisions: Summary & Conclusions

Conclusions

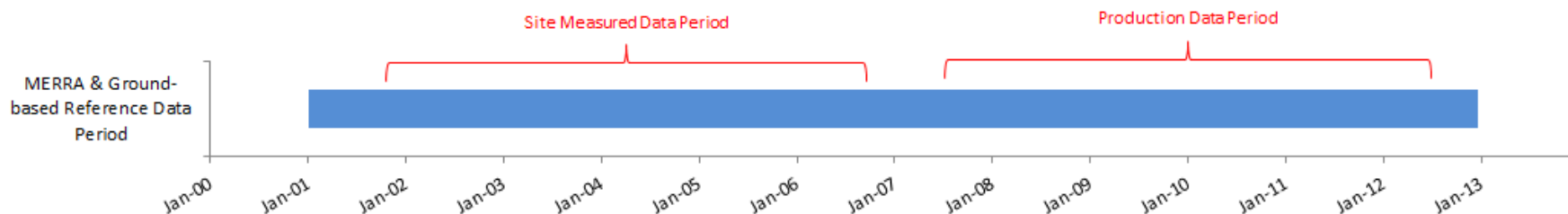
- **CREYAP II Objectives**
 - Promote discussion of the challenges involved in resource assessment
 - Explore the impact of industry standard models and approaches
 - Allow organisations to benchmark themselves against the rest of the industry
- Although the absolute results are important, value can be taken from analysing the range of assumptions and techniques employed by participants
 - The discussions surrounding the CREYAP II exercise are an integral part of the exercise
 - While the error may introduce bias into the benchmarking, it does not devalue the objectives of CREYAP II and has proven to be a valuable learning experience



CREYAP II Data Pack - Revisions: Summary & Conclusions

Conclusions

- The MERRA data provided in the CREYAP II data pack (released February 2013) should no longer be used
- Participants are free to download an amended data pack and submit a simplified set of results
 - The objective will be to predict the energy yield for the wind farm production period only (see below)
 - Predictions will be compared with availability-corrected production data (no windiness correction will be applied)
 - Updated results will be presented at the AWEA Wind Resource & Project Energy Assessment Seminar, December 2013



CREYAP II Data Pack - Revisions: Lessons Learned

Lessons Learned

- Care must be taken when extracting re-analysis data
 - It is advisable to extract more than one MERRA node for comparison
- Agreement in results does not necessarily mean that all reference data sources are reliable
- Visual and statistical assessment of reference data should always be complemented by thorough checks of meta-data





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