



Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project

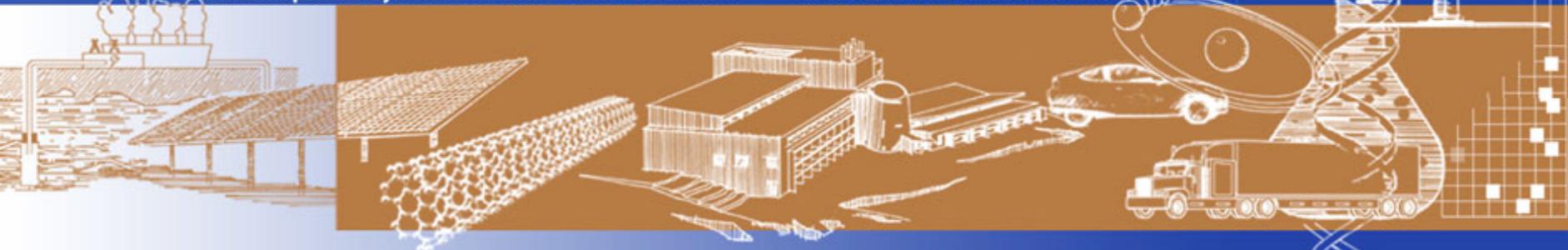
**First Set of Composite Data Products
for Publication - March 1, 2006**

Keith Wipke, Cory Welch, Holly Thomas, and Sam Sprik

Technical Report
NREL/TP-560-41153
February 2007

NREL is operated by Midwest Research Institute • Battelle

Contract No. DE-AC36-99-GO10337





NOTICE

This report was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

Available electronically at <http://www.osti.gov/bridge>

Available for a processing fee to U.S. Department of Energy
and its contractors, in paper, from:

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
phone: 865.576.8401
fax: 865.576.5728
email: <mailto:reports@adonis.osti.gov>

Available for sale to the public, in paper, from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
phone: 800.553.6847
fax: 703.605.6900
email: orders@ntis.fedworld.gov
online ordering: <http://www.ntis.gov/ordering.htm>



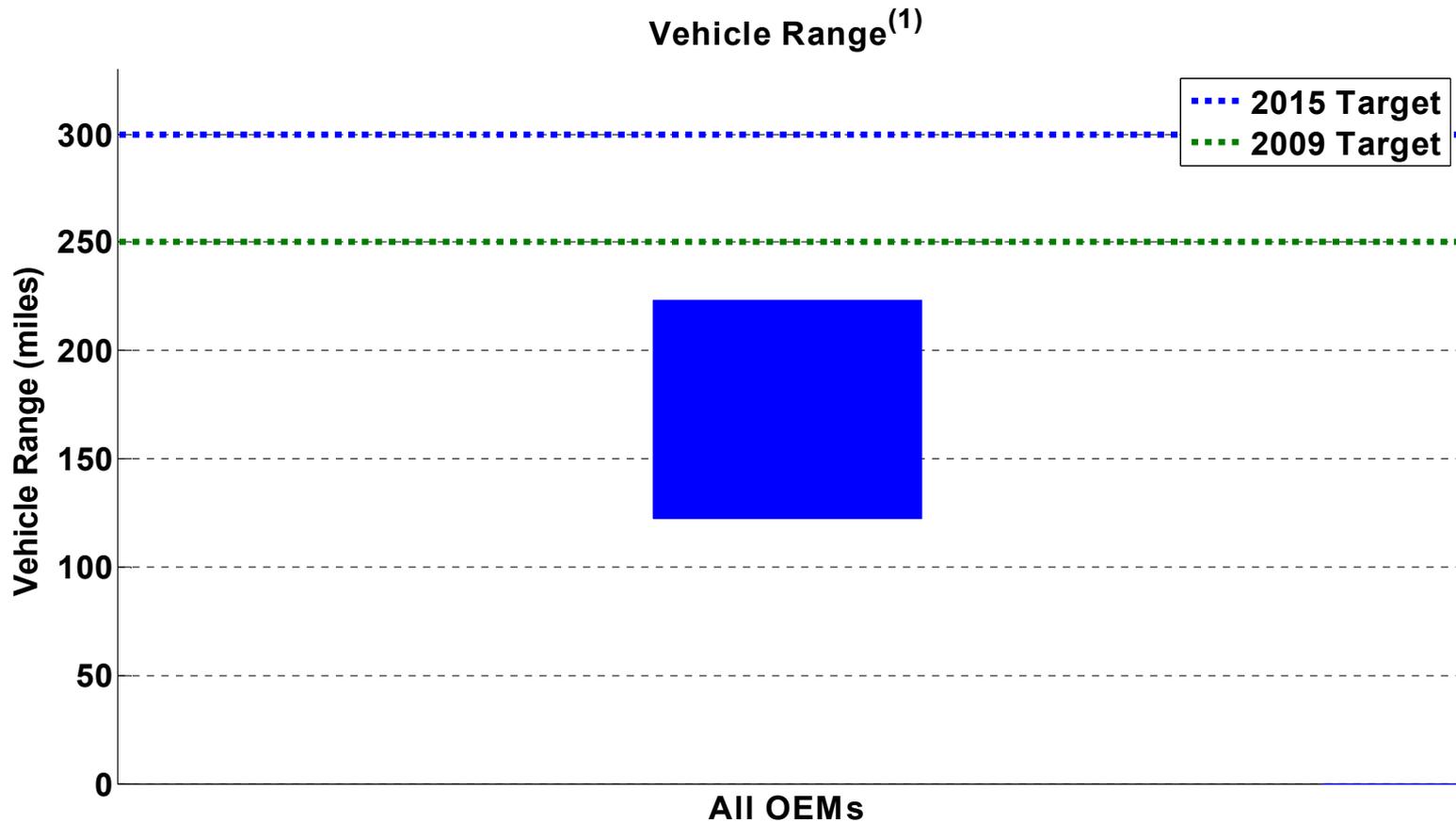
Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project – *First Set of Composite Data Products for Publication*

Keith Wipke, Cory Welch, Holly Thomas, Sam Sprik

March 1, 2006

Prepared under Task No. H270.8100

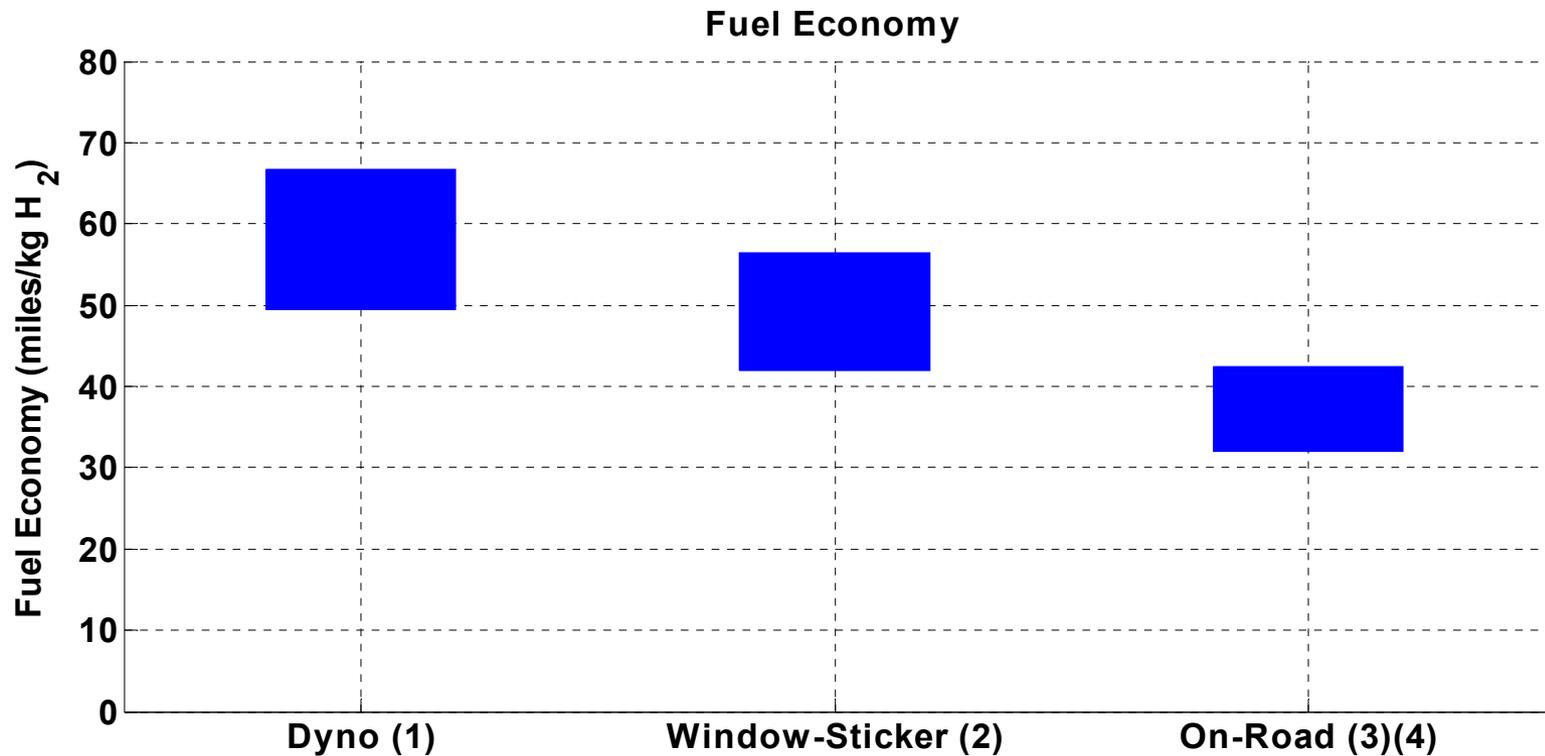
CDP#2: Vehicle Range



Created: 21-Feb-2006

(1) Calculated from combined City/Hwy fuel economy (dyno test) per DRAFT SAE J2572 and usable fuel on board.

CDP#6: Fuel Economy



(1) One data point for each make/model. Combined City/Hwy fuel economy per DRAFT SAEJ2572.

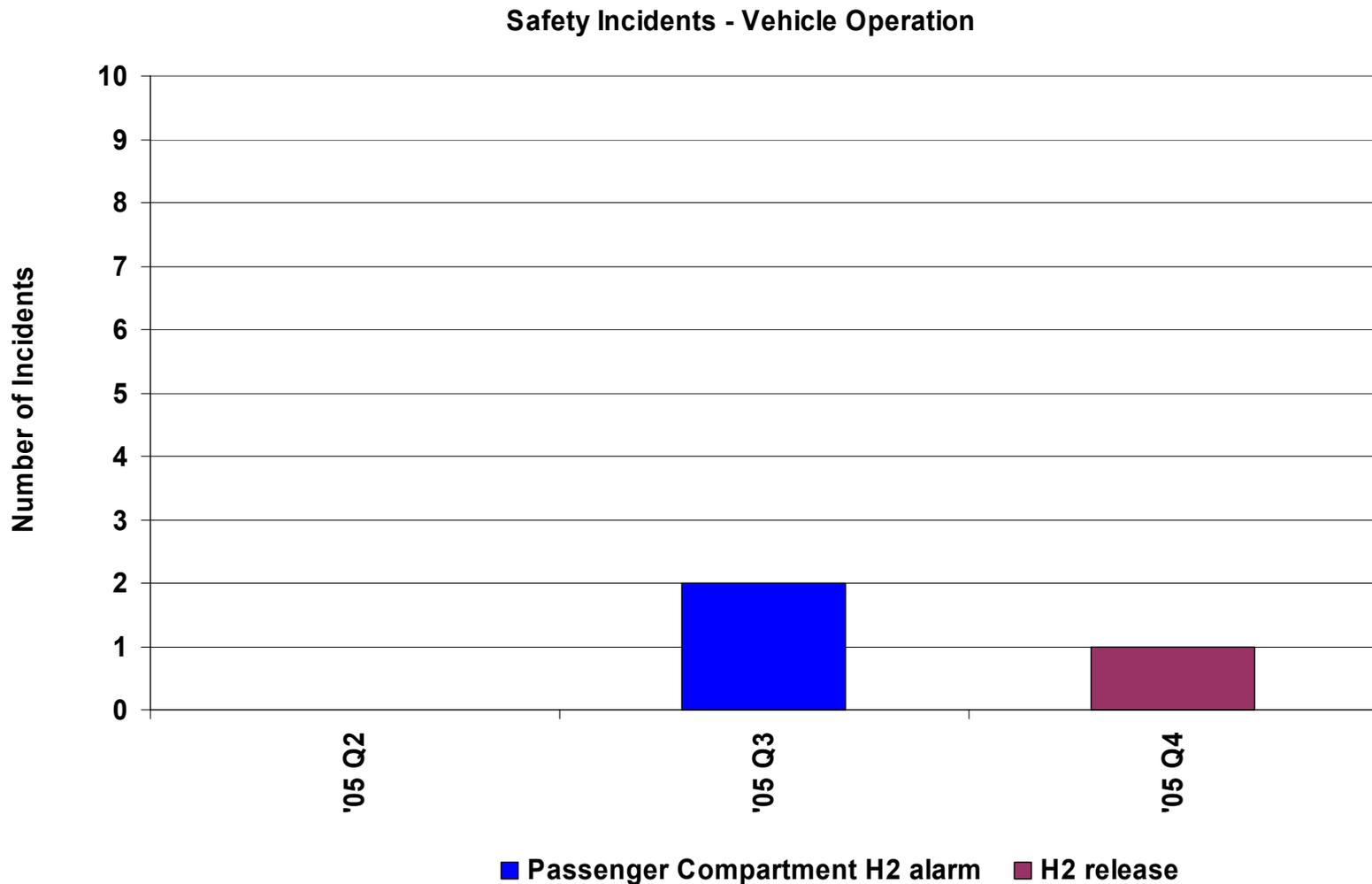
(2) Adjusted combined City/Hwy fuel economy (0.78 x Hwy, 0.9 x City).

(3) Excludes trips < 1 mile. One data point for on-road fleet average of each make/model.

(4) Calculated from on-road fuel cell stack current or mass flow readings.

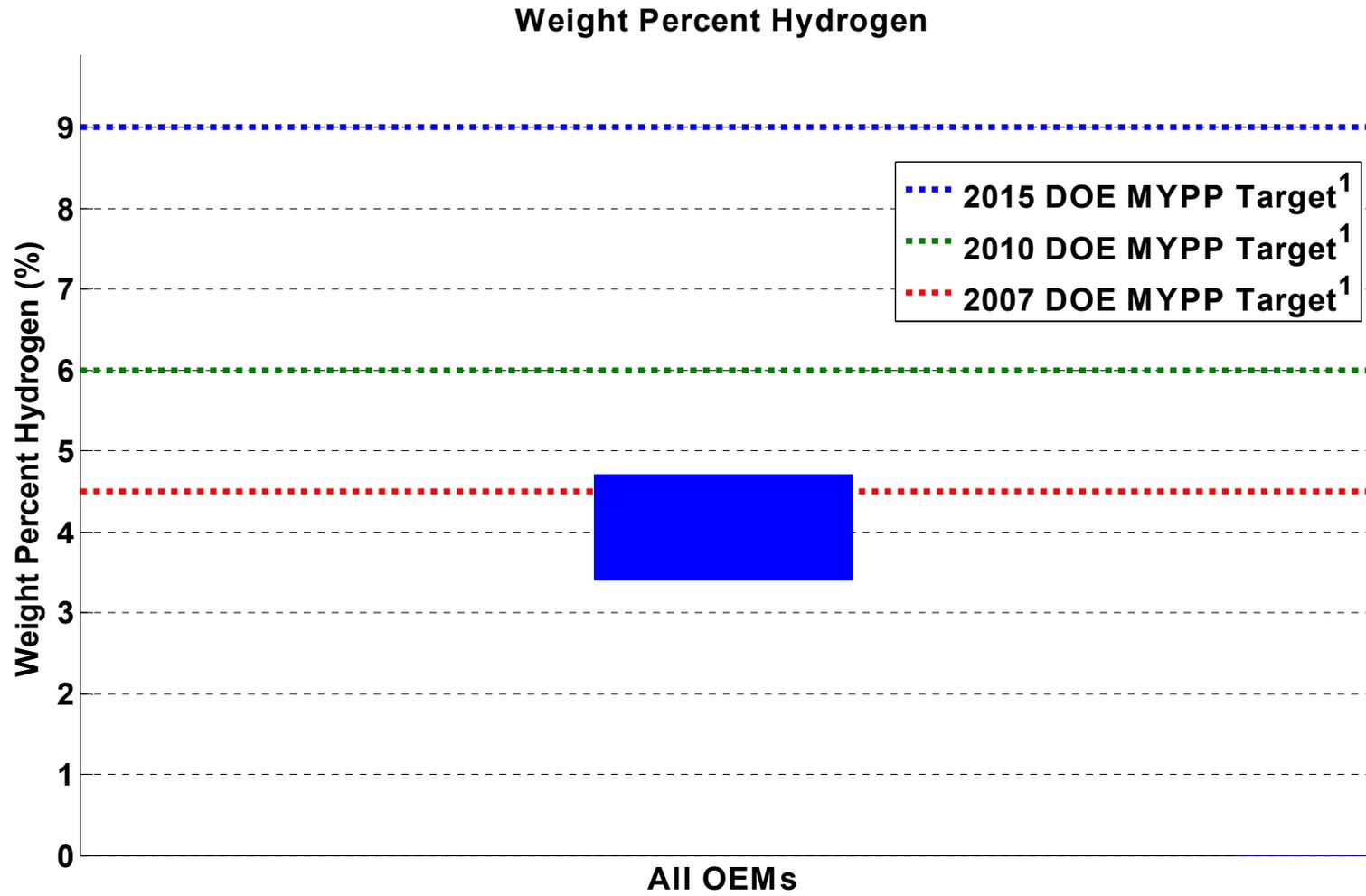
Created: 16-Feb-2006

CDP#9: Safety Incidents – Vehicles



Created 21-Feb-2006

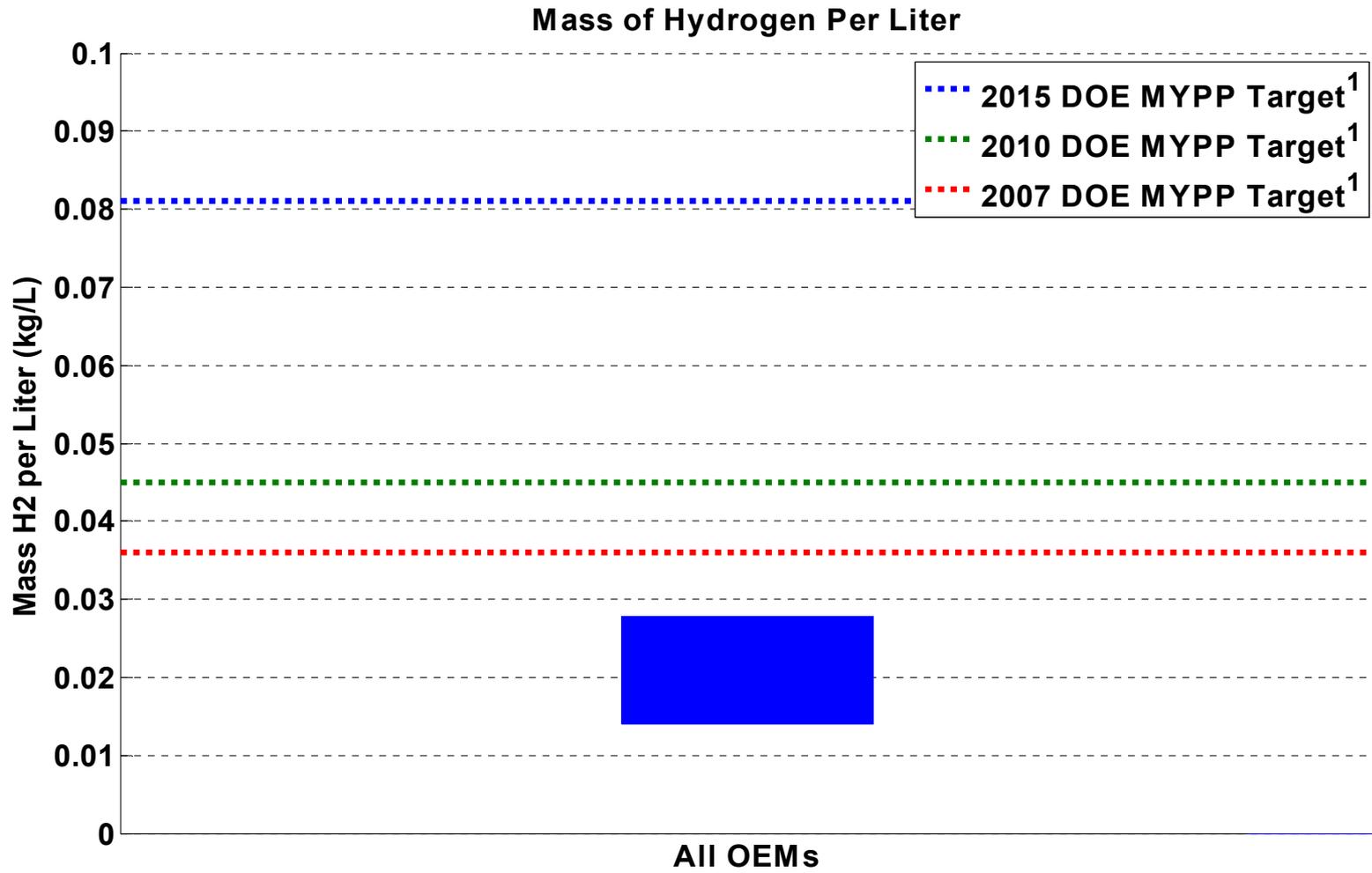
CDP#10: Storage Weight % Hydrogen



Created: 23-Feb-2006

¹Some near-term targets have been achieved with compressed and liquid tanks. Emphasis is on advanced materials-based technologies.

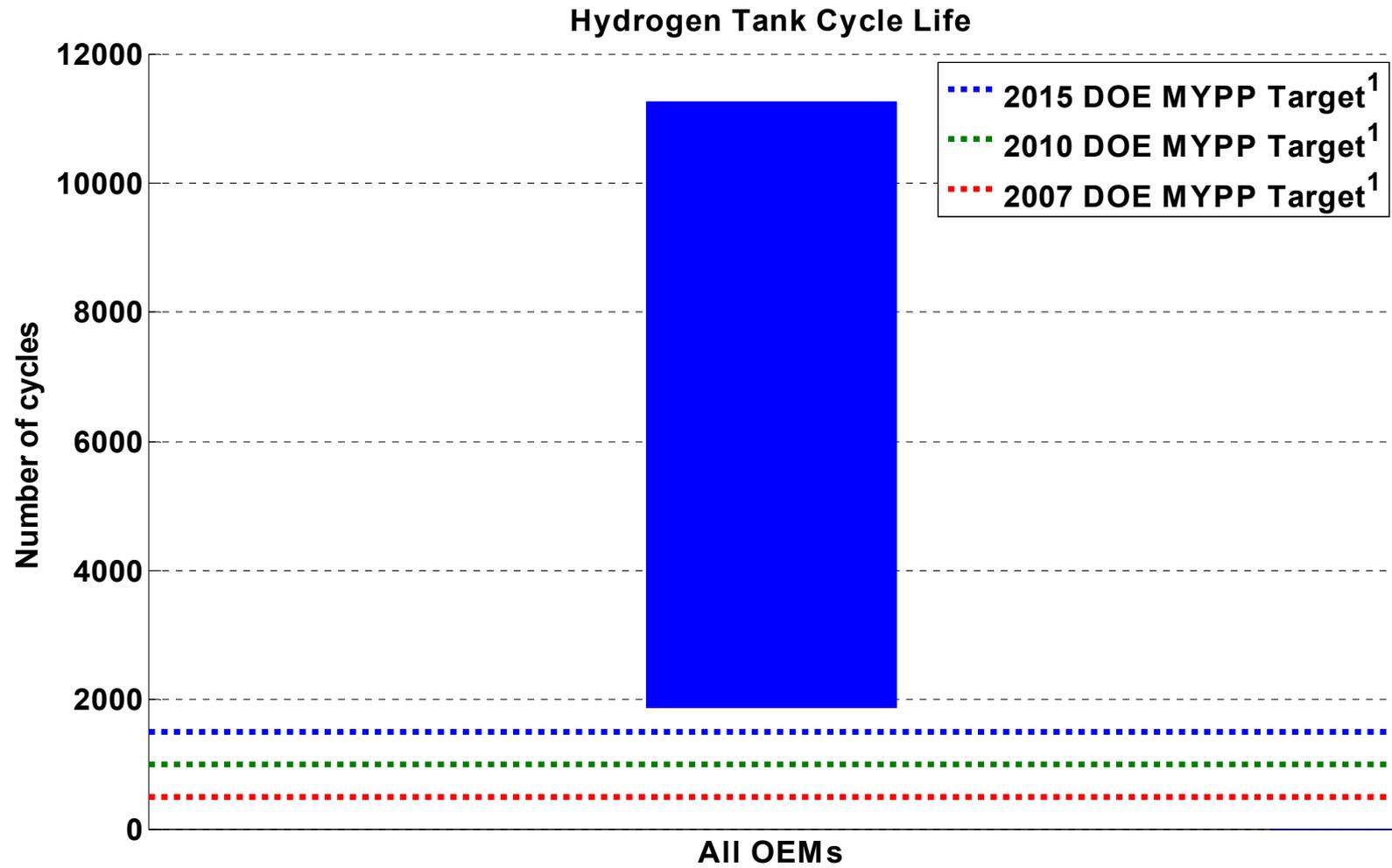
CDP#11: Volumetric Capacity of H2 Storage



Created: 23-Feb-2006

¹Emphasis is on advanced materials-based technologies.

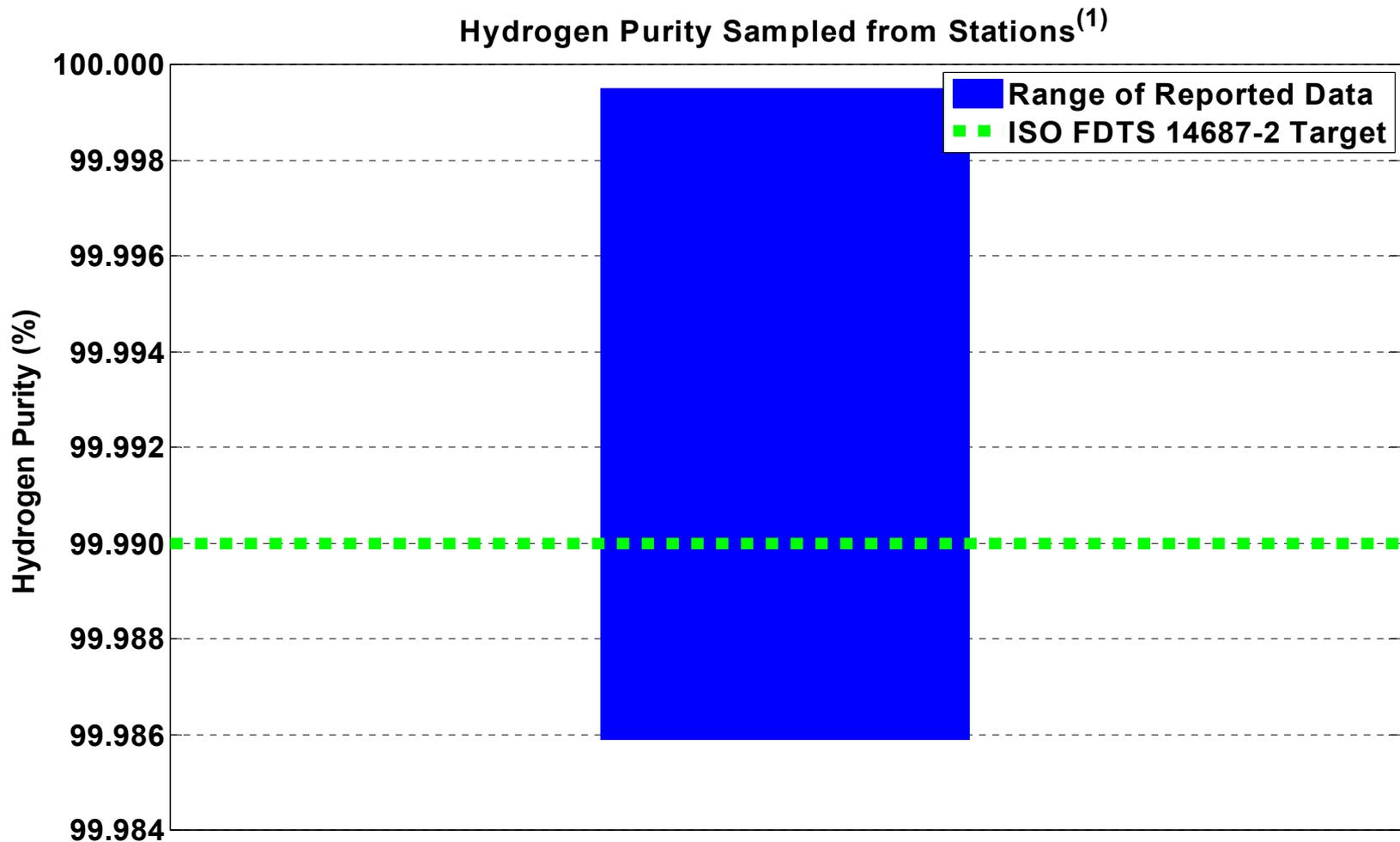
CDP#12: Vehicle Hydrogen Tank Cycle Life



Created: 23-Feb-2006

¹Some near-term targets have been achieved with compressed and liquid tanks. Emphasis is on advanced materials-based technologies.

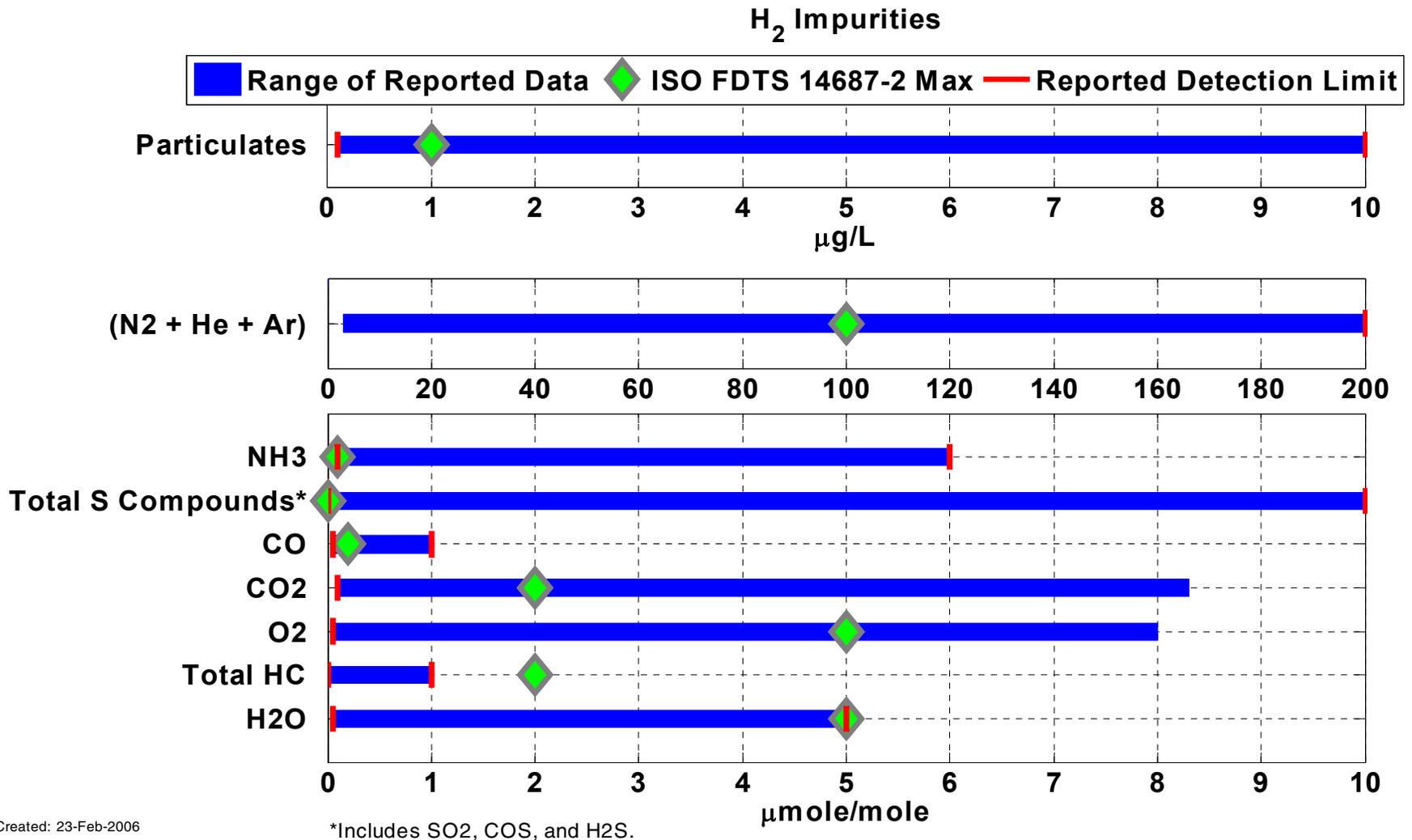
CDP#16: H2 Purity Sampled from Stations



Created: 21-Feb-2006

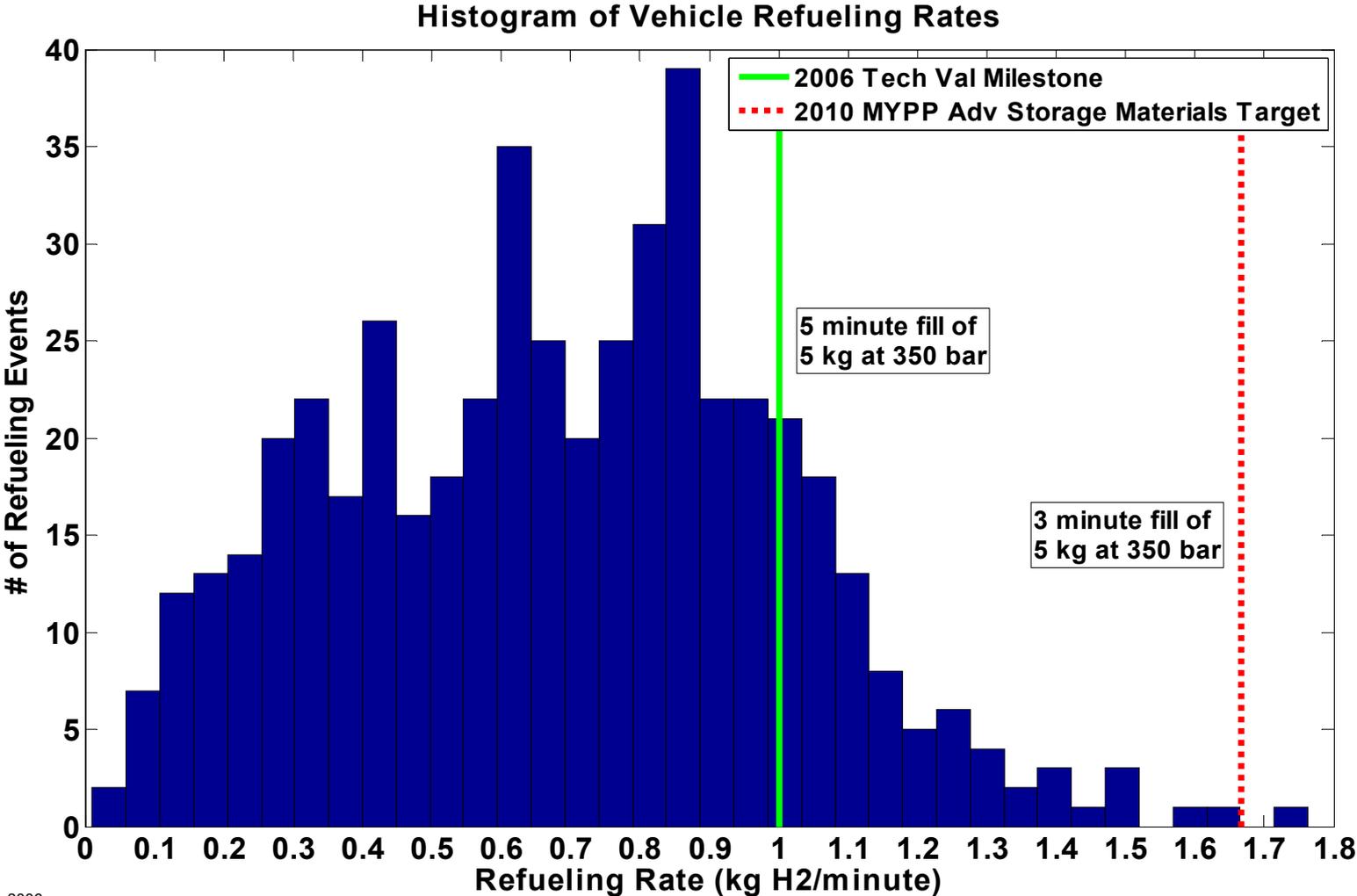
(1) Includes sampling from both electrolysis and reforming

CDP#17: H₂ Impurities



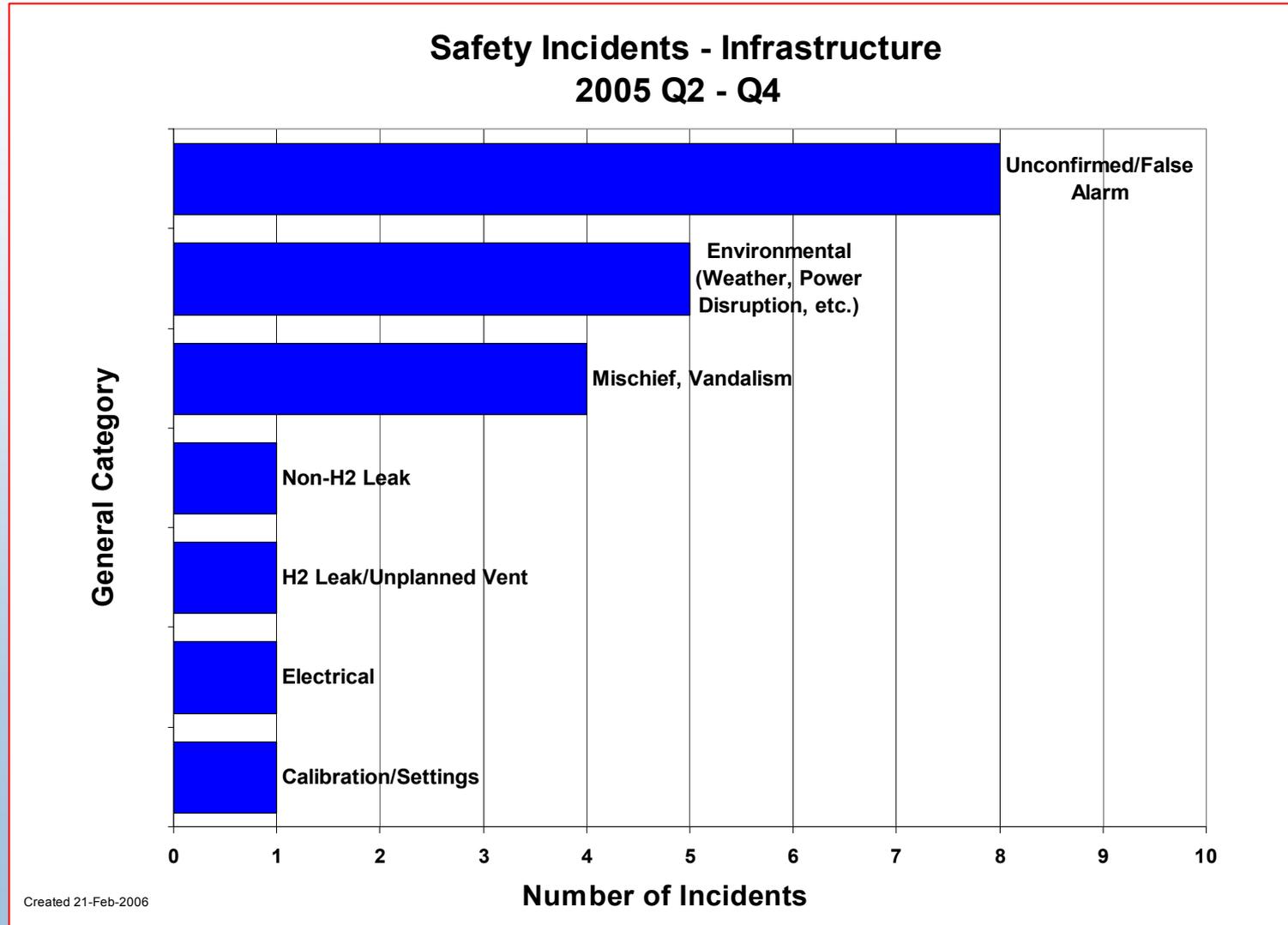
Created: 23-Feb-2006

CDP#18: Histogram: Refueling Rate

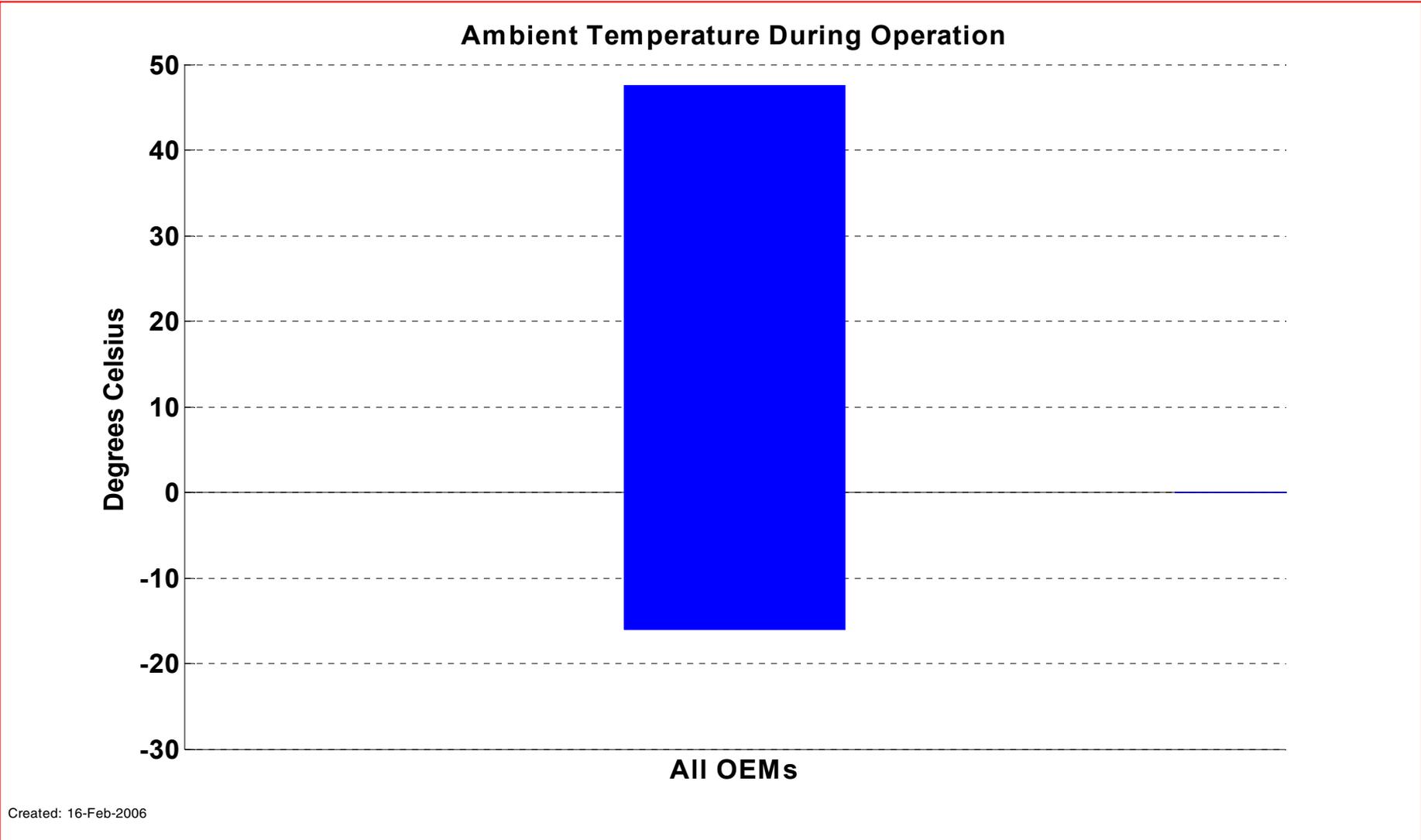


Created: 21-Feb-2006

CDP#20: Safety Incidents – Infrastructure

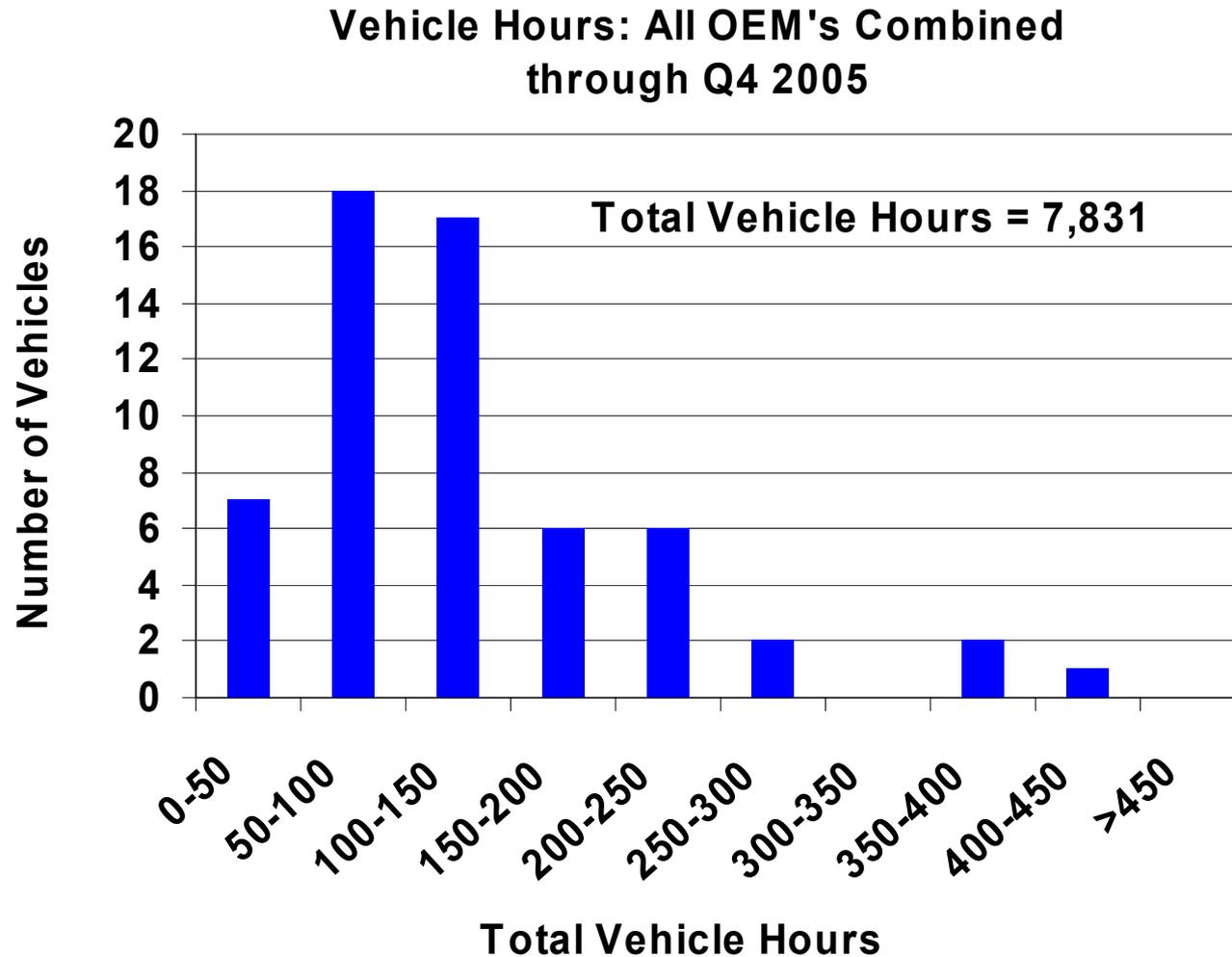


CDP#21: Range of Ambient Temperature During Vehicle Operation



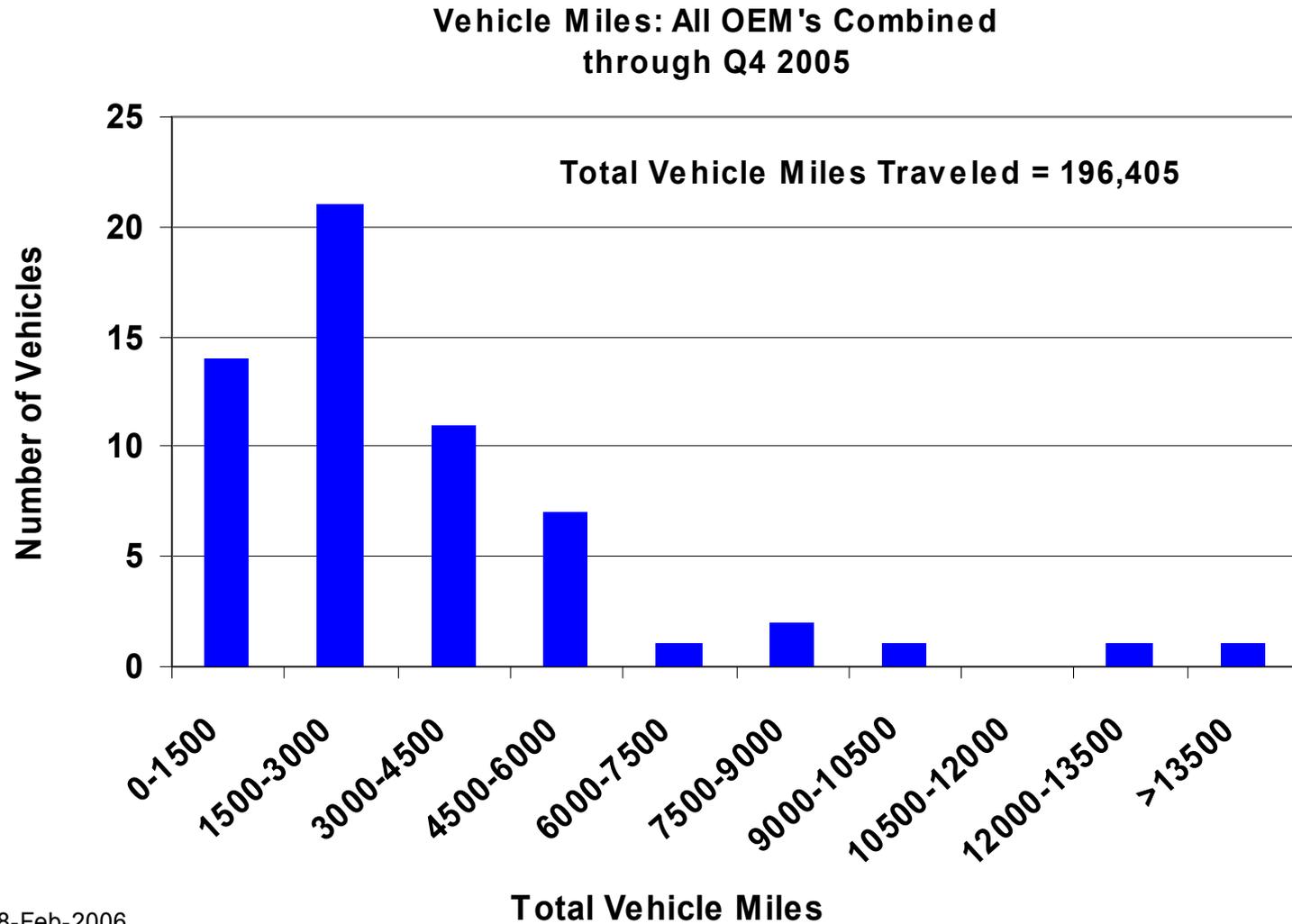
Created: 16-Feb-2006

CDP#22: Vehicle Operating Hours



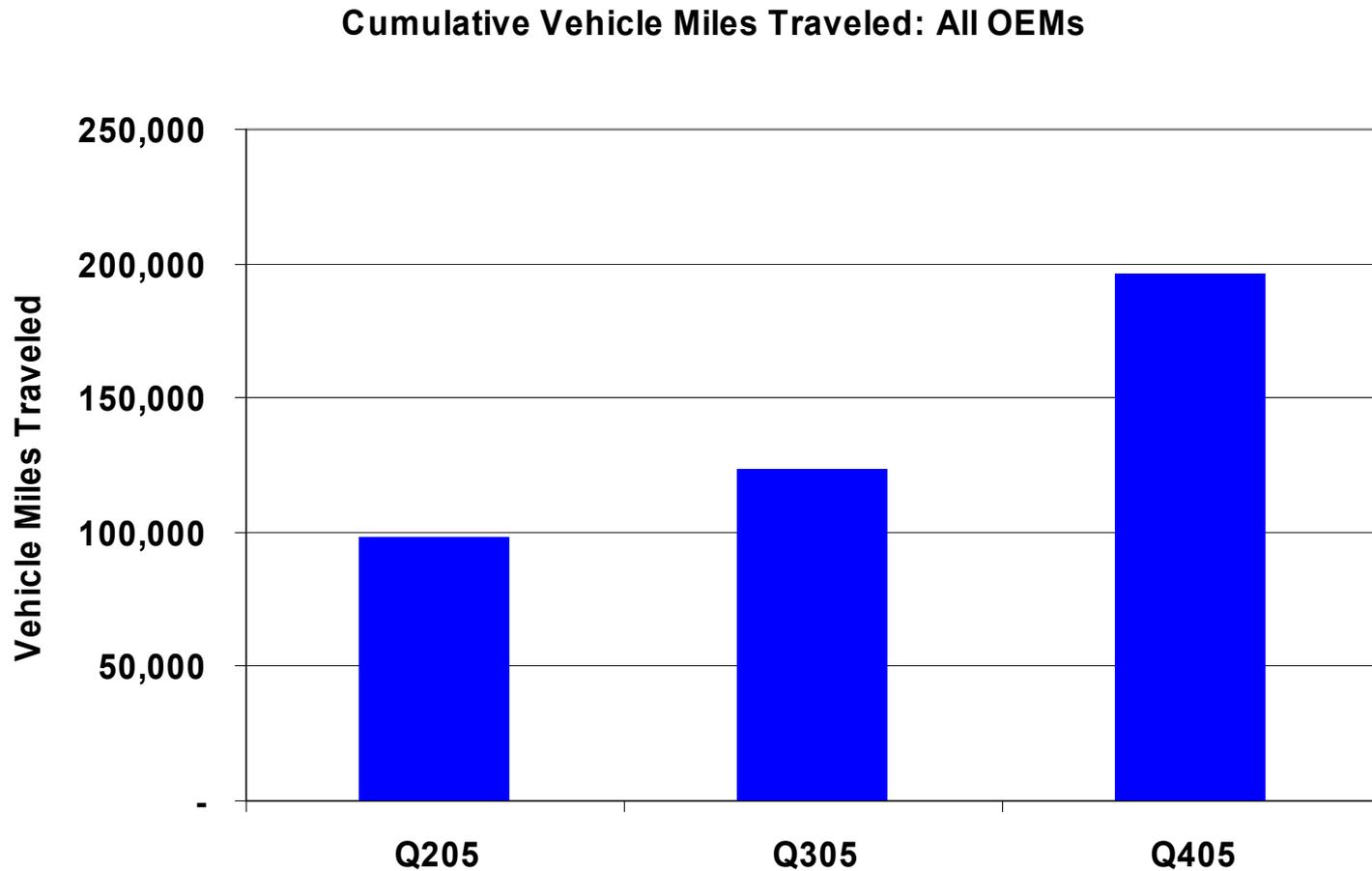
Created: 16-Feb-2006

CDP#23: Vehicles vs. Miles Traveled



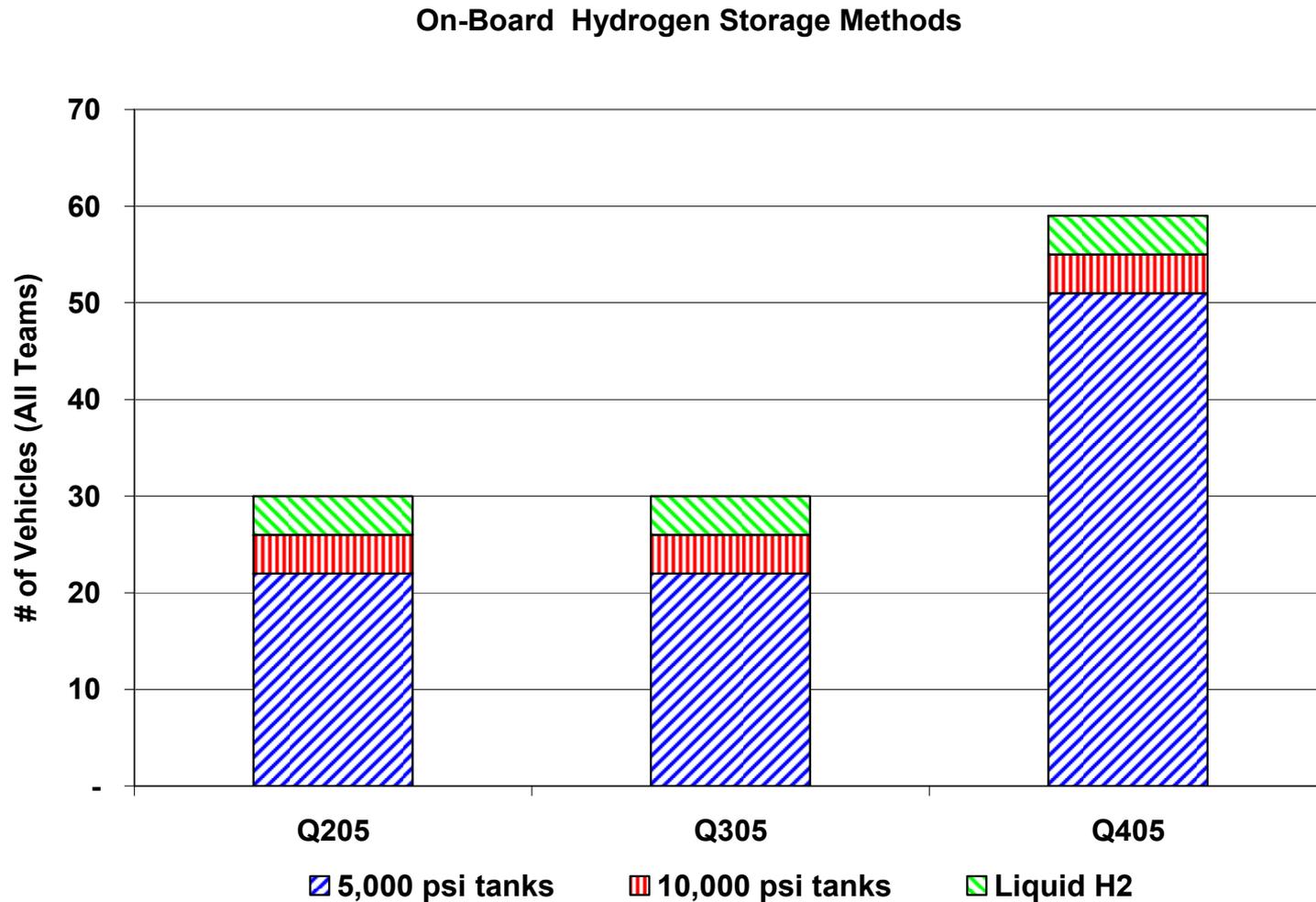
Created: 28-Feb-2006

CDP#24: Cumulative Vehicle Miles Traveled



Created: 16-Feb-2006

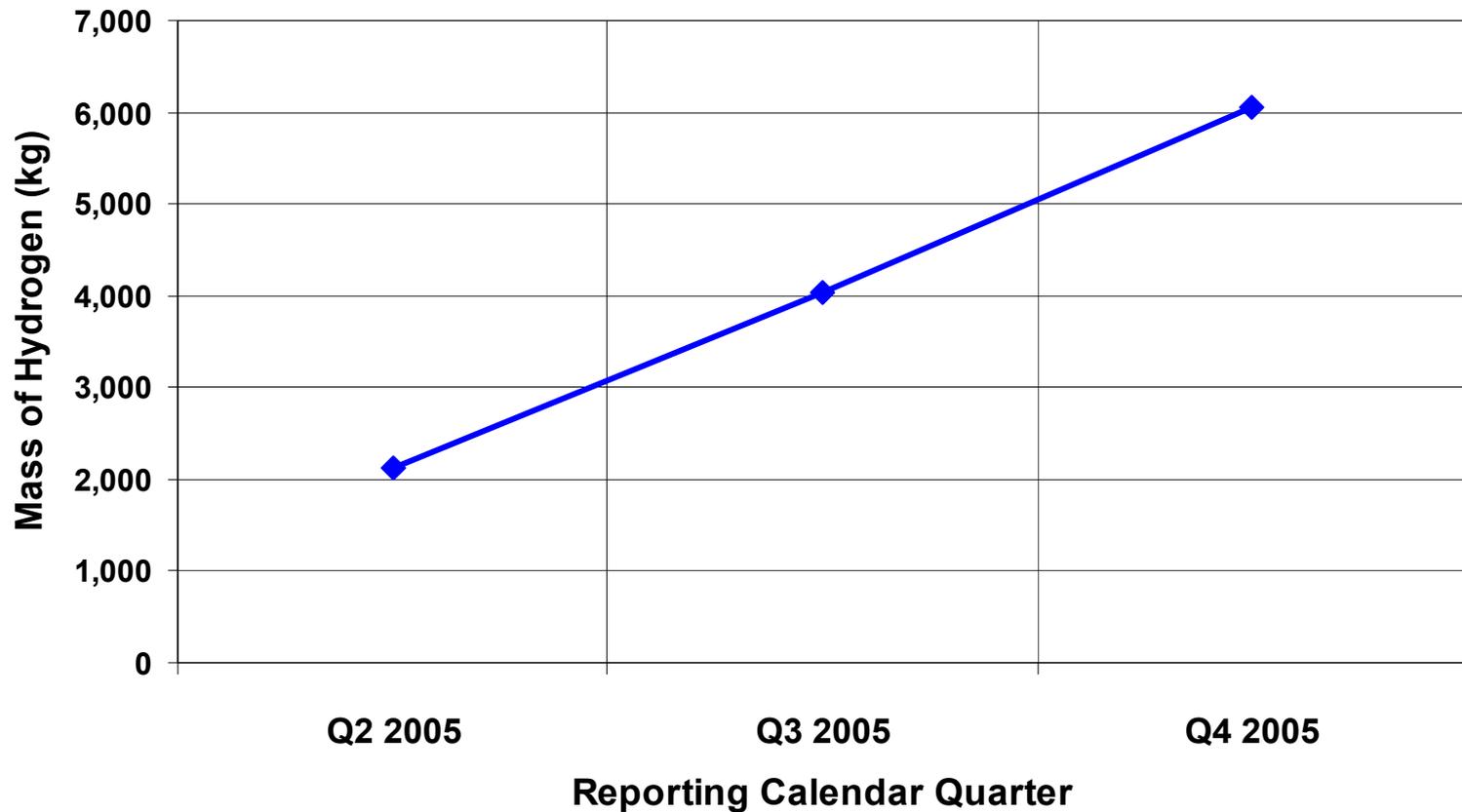
CDP#25: Vehicle H2 Storage Technologies



Created 16-Feb-2006

CDP#26: Cumulative H2 Produced or Dispensed

Cumulative Hydrogen Produced or Dispensed
All Teams Combined



Created 21-Feb-2006

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Executive Services and Communications Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.

1. REPORT DATE (DD-MM-YYYY) February 2007		2. REPORT TYPE Technical Report		3. DATES COVERED (From - To) 4/05 - 3/06		
4. TITLE AND SUBTITLE Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project, First Set of Composite Data Products for Publication			5a. CONTRACT NUMBER DE-AC36-99-GO10337			
			5b. GRANT NUMBER			
			5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S) Keith Wipke			5d. PROJECT NUMBER NREL/TP-560-41153			
			5e. TASK NUMBER H270-8100			
			5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Renewable Energy Laboratory 1617 Cole Blvd. Golden, CO 80401-3393				8. PERFORMING ORGANIZATION REPORT NUMBER NREL/TP-560-41153		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S) NREL		
				11. SPONSORING/MONITORING AGENCY REPORT NUMBER		
12. DISTRIBUTION AVAILABILITY STATEMENT National Technical Information Service U.S. Department of Commerce 5285 Port Royal Road Springfield, VA 22161						
13. SUPPLEMENTARY NOTES						
14. ABSTRACT (Maximum 200 Words) This presentation provides the initial composite data products available for publication from NREL's Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project.						
15. SUBJECT TERMS composite data products; technology validation; Controlled Hydrogen Fleet and Infrastructure Demonstration and Validation Project; learning demonstration						
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UL	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON	
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (Include area code)	

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18