2014 IMPACT

Insight and analysis of events that impact the nonwovens market.
Insight and analysis into events impacting the nonwovens industry:

- The Wiper Rule: Impact on the Industrial Wipes Market
- Boomer Echo: Impact on the Absorbent Hygiene Market
- ACA and HAIs: Impact on the Disposable Nonwovens Markets
- Coal Ash Storage and Hydraulic Fracturing Regulation: Impact on the Geosynthetics Market
INDA Impact 2014

Foreword

It is my pleasure to introduce the inaugural addition of the INDA Impact report. It is INDA’s intent to provide industry thought leadership through the gathering, analysis and dissemination of relevant, reliable and insightful market information and industry reports to aid in decision making. The INDA Impact report is one of our new vehicles to communicate this information, one which will be published on an annual basis.

The objective of this report is to provide deeper insight and quantitative analysis of events — which we refer to as Drivers of Change — which could be game changers, tipping points, opportunities, disruptors, or threats to and for the nonwovens industry.

This year’s issue of INDA Impact provides insight into four events — across a spectrum of nonwoven end uses — that could substantially impact the nonwovens industry. They are:


II. Boomer Echo: Impact on the Absorbent Hygiene Market;

III. ACA and HAIs: Impact on the Disposable Nonwovens Markets; and


Each of these events includes a conventional thinking statement of what is generally known and believed in regards to the event, followed by an assessment section which takes a deeper examination of the event, the nonwoven market(s) impacted, and the issues that could drive additional nonwovens usage. Each of the events finishes with a results section which quantifies and presents the nonwoven potential.

Individually each of the events may appear to be insignificant in regards to the tonnage added to the nonwovens industry. These tonnes identified in the report are incremental tonnage, which are in addition to the tonnes from the previous forecasted growth.

In totality these four events could be quite significant to the nonwovens industry, summing to an additional 128,000 incremental tonnes over a three-year period. If these events were all to pan out as identified, that’s nearly 43,000 tonnes a year. This is in addition to the 101,000-tonnes-a-year growth based on INDA’s annual forecasted growth rate of 4.9 percent from 2012 to 2017.
It is INDA’s intention to continue to improve the quality of data and industry information each year. Your comments help to drive that continued improvement, and we would appreciate any feedback on this year’s report and any suggestions you may have for future topics of the INDA Impact. Please feel free to contact myself or the author, Brad Kalil, on any aspect of this report.

Dave Rousse, President
INDA, Association of the Nonwoven Fabrics Industry
drousse@inda.org
919.233.1210 x130

Brad Kalil, Director of Market Research and Statistics
INDA, Association of the Nonwoven Fabrics Industry
bkalil@inda.org
919.233.1210 x134
# TABLE OF CONTENTS


A. Executive Summary .................................................................I-1

B. Introduction ....................................................................................I-2
   1. Background ..............................................................................I-2
   2. Objective ...............................................................................I-3

C. Methods ........................................................................................I-4
   1. The ‘Solvent Contaminated Wipes’ Final Rule .........................I-4
   3. The Industrial/Institutional Wipes Market ...............................I-6
      a. Overall Nonwoven Wipes Market ..........................................I-7
      b. Reusable Laundered Shop Towels/Wipes .................................I-9
      c. Disposable Cloth Towels/Rags .............................................I-11
      d. Disposable Nonwoven Wipes .............................................I-11

D. Results ........................................................................................I-14
   1. Market Size Opportunity for Disposable Nonwoven Wipes ......I-15
   2. Update to the Industrial and Institutional Wipes Forecast ..........I-16

E. Discussion ......................................................................................I-19
   1. For Additional Information on the Wiper Rule .........................I-19

## II. Boomer Echo: Impact on the Absorbent Hygiene Market ..........II-1

A. Executive Summary ........................................................................II-1

B. Introduction ....................................................................................II-2
   1. Background ..............................................................................II-2
   2. Objective ...............................................................................II-3

C. Methods ........................................................................................II-4
   1. United States Birth Data ..........................................................II-4
   2. Baby Diaper Usage and Nonwoven Consumption .....................II-7
   3. Millennial Attitudes ..................................................................II-11
   4. Female Population in the United States .....................................II-13

D. Results ........................................................................................II-14
   1. Birth Rate Forecast .................................................................II-14
2. Update to the Absorbent Hygiene Diaper Forecast .................................... II-18
E. Discussion ................................................................................................. II-21

III. ACA and HAI: Impact on the Disposable Nonwovens Markets ..... III-1
A. Executive Summary .................................................................................... III-1
B. Introduction ................................................................................................ III-3
   1. Background ............................................................................................ III-3
      a. Healthcare-Associated Infections ...................................................... III-3
      b. Patient Protection and Affordable Care Act .................................... III-4
   2. Objective ................................................................................................ III-5
C. Assessment ................................................................................................. III-6
   1. Patient Protection and Affordable Care Act of 2010 (ACA) ..................... III-6
      a. Value-Based Purchasing – Linking Payment to Quality ................. III-6
      b. Increased Transparency ................................................................ III-11
D. Results ...................................................................................................... III-14
   1. Impacted Nonwovens Markets ................................................................. III-15
      a. Medical Nonwovens Market ........................................................... III-16
      b. Absorbent Hygiene Market .............................................................. III-18
      c. Filtration Market ............................................................................. III-19
      d. Wipes Market ................................................................................. III-20
E. Discussion ................................................................................................ III-22

IV. Potential Coal Ash Storage and Hydraulic Fracturing Regulation:
   Impact on the Geosynthetics Market........................................................ IV.1
A. Executive Summary .................................................................................... IV.1
B. Introduction ................................................................................................ IV.3
   Background ................................................................................................ IV.3
   Coal Ash ..................................................................................................... IV.3
   Hydraulic Fracturing ................................................................................. IV.3
   Objective ................................................................................................... IV.6
C. Assessment ................................................................................................. IV.7
   Geosynthetics .......................................................................................... IV.7
   Geotextiles ............................................................................................... IV.8
Geomembranes ........................................................................................................... IV.9
Geosynthetic Clay Liners ........................................................................................ IV.9
Geocomposite Drainage ....................................................................................... IV.9
Nonwoven Geosynthetics Market ...................................................................... IV.10
Coal Ash Storage .................................................................................................. IV.11
  Initial Environmental Protection Agency Involvement ...................................... IV.12
  Congress Involvement ...................................................................................... IV.14
  Recent Activities .............................................................................................. IV.14
Hydraulic Fracturing .......................................................................................... IV.16
D. Results .......................................................................................................... IV.18
  Coal Ash Storage .............................................................................................. IV.18
    Nonwoven Geosynthetic Opportunities ...................................................... IV.19
  Hydraulic Fracturing ...................................................................................... IV.19
    Nonwoven Geosynthetic Opportunities ...................................................... IV.20
  Nonwoven Geosynthetics Market .................................................................... IV.22
E. Discussion ....................................................................................................... IV.23
LIST OF FIGURES

   Figure 1 Status of Wiper Rule Implementation by State ................................I-5
   Figure 2 2012 North American Nonwoven Wipes Markets (Sales) .............I-7
   Figure 3 2012 North American Nonwoven Wipes Markets (Tonnes) ............I-7
   Figure 4 Overview of Industrial and Institutional Wipes Market .................I-9
   Figure 5 Current Market Information Industrial General Purpose Wipes ......I-11
   Figure 6 2012 North American Industrial General Market ......................I-14
   Figure 7 Industrial/Institutional Nonwoven Wipes Sales to End Users Forecast ..................................................................................I-17
   Figure 8 Industrial General Purpose Nonwoven Wipes Sales to End Users Forecast ..................................................................................I-17
   Figure 9 Industrial/Institutional Nonwoven Wipes Tonnage Forecast .........I-18
   Figure 10 Industrial General Purpose Nonwoven Wipes Tonnage Forecast.....I-18
   Figure 11 Forecasted Market Information Industrial General Purpose Nonwoven Wipes .................................................................I-19

II. Boomer Echo: Impact on the Absorbent Hygiene Market
   Figure 1 Selected U.S. Birth Data 1950-2012 ........................................II-4
   Figure 2 Selected U.S. Birth Data 1987-2012 ........................................II-6
   Figure 3 Current Market Information Absorbent Hygiene Market .............II-7
   Figure 4 Total Potential Children in Baby Diapers, 1992-2012 .................II-8
   Figure 5 U.S. Disposable Baby Diaper Demand, 1992-2012 ...................II-10
   Figure 6 Marital Status at Ages 18-30 ...................................................II-11
   Figure 7 Do You Want to Get Married ..................................................II-12
   Figure 8 Do You Want to Have Children .............................................II-12
   Figure 9 U.S. Female Population by Age .............................................II-13
   Figure 10 Fertility Rates by Age of Mother, 2002-2012 .........................II-14
Figure 11  Fertility Rates by Age of Mother, 2002-2022.........................II-15
Figure 12  Total Number of U.S. Births, 1950-2022...............................II-16
Figure 13  Total Potential Children in Baby Diapers, 1992-2022........II-18
Figure 14  U.S. Disposable Baby Diaper Demand, 1992-2022...............II-19
Figure 15  Year-over-Year Percentage Growth Comparisons Births, Diaper
          Potential and Nonwovens Baby Diaper Demand ......................II-20
Figure 16  Forecasted Market Information Absorbent Hygiene Disposable
          Baby Diapers ........................................................................II-21

III. ACA and HAIs: Impact on the Disposable Nonwovens Markets

Figure 1  Hospital Compare – Comparison Measures .....................III-11
Figure 2  Hospital Compare – HAI Comparison .............................III-13
Figure 3  North American Nonwovens Market, 2012 .........................III-15
Figure 4  Potential Impact of the ACA and HAIs on the Disposable
          Nonwovens Markets...............................................................III-23

IV. Coal Ash Storage and Hydraulic Fracturing Regulation: Impact on the
     Geosynthetics Market

Figure 1  Lower 48 Shale Plays..........................................................IV-4
Figure 2  U.S. Geosynthetic Market Segments .................................IV-8
Figure 3  Current Market Information Geosynthetics Market ............IV-10
Figure 4  Coal Ash Impoundment Failure: Kingsport, TN...............IV-13
Figure 5  Diagram of Typical Hydraulic Fracturing Operation ..........IV-17
Figure 6  Geosynthetic Opportunities at a Shale Gas Well Site..........IV-22
LIST OF TABLES

   Table 1  2012 Overall Industrial and Institutional Wipes Market ......................I-8
   Table 2  Disposable Nonwoven Wipes Opportunity Within the Industrial General Purpose Wipes Segment ..................................................I-15
   Table 3  Industrial General Purpose Segment Nonwovens Wipes Forecast ....I-16
   Table 4  Industrial and Institutional Market Nonwoven Wipes Forecast ......I-17

II. **Boomer Echo: Impact on the Absorbent Hygiene Market**
    Table 1  Diaper Changes per Day by Age ......................................................II-9
    Table 2  Annual Growth Rates over the forecast Period .........................II-21

III. **ACA and HAIs: Impact on the Disposable Nonwovens Markets**
    Table 1  Medical Nonwovens Market ACA/HAI Impact Forecast ..............III-17
    Table 2  Underpads Segment ACA/HAI Impact Forecast .........................III-18
    Table 3  Filtration Segments ACA/HAI Impact Forecast .........................III-20
    Table 4  Healthcare and Institutional Care Wipes Segment ACA/HAI Impact Forecast ..................................................III-21

IV. **Coal Ash Storage and Hydraulic Fracturing Regulation : Impact on the Geosynthetics Market**
    Table 1  Geosynthetics Coal Ash Storage and Hydraulic Fracturing Impact Forecast ..................................................IV-23